

ATD Report 66-64

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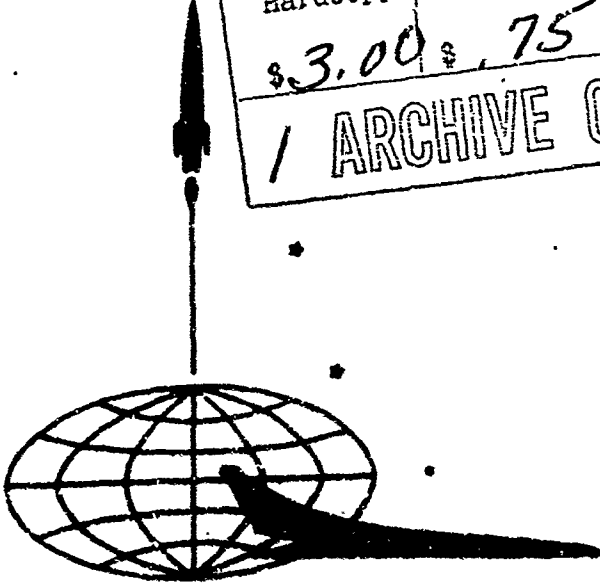
C B E FACTORS

Monthly Survey No. 6

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ABSTRACT:

This monthly survey is based on Communist World open sources. It is the sixth in a series of monthly surveys covering the following areas: I. Chemical factors (pesticides, herbicides, fertilizers, psychotomimetics, other chemicals); II. Biological factors (pathogens); III. Environmental factors (aerosols, ecology, micrometeorology, soil science). Available translations of additional sources pertinent to the three subject areas are listed respectively in Appendixes 1-3. Titles of publications cited in Sections I—III are listed alphabetically in Appendix 4. There is no bibliography.

ATD Report 66-64

CBE FACTORS

Monthly Survey No. 6

ATD Work Assignment No. 50

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FOREWORD

This report is the sixth in a series of monthly surveys covering the following areas:

- I. CHEMICAL FACTORS
 - Pesticides
 - Herbicides
 - Fertilizers
 - Psychotomimetics
 - Other Chemicals
- II. BIOLOGICAL FACTORS
 - Pathogens
- III. ENVIRONMENTAL FACTORS
 - Aerosols
 - Ecology
 - Micrometeorology
 - Soil Science

Available translations of additional sources pertinent to these subject areas are listed in Appendixes 1--3. Titles of publications cited in Sections I--III are listed alphabetically in Appendix 4.

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I. CHEMICAL FACTORS

THE KINETICS OF HYDROLYSIS OF ACETYLCHOLINE WITH ACETYLCHOLINESTERASE

Brestkin, A. P., L. A. Ivanova, and V. V. Svechnikova.
The effect of choline upon the rate of hydrolysis of acetylcholine with acetylcholinesterase from bovine erythrocytes.
Biokhimiya, v. 31, no. 2, 1966, 416-423.

This study concerned the kinetics of the hydrolysis of acetylcholine (AC) with acetylcholinesterase (ACE) from the cytoplasm of bovine erythrocytes in the presence of choline as inhibitor (I) at 37°C, pH 7.8, substrate concentrations (S) from 0.0018 to 0.0173 M, and choline concentration (I) from 0.01 to 0.1 M. Straight lines are obtained when the reciprocal rate $1/v$ is plotted against (I). The slopes of these straight line when plotted against $1/(S)$ produce a curve with a minimum. This relationship contradicts the accepted kinetic schemes for the reaction of ACE with AC in the presence of reversible inhibitors. It is proposed that the reason for the inhibition of the enzyme reaction by high substrate concentration is not the decrease in the number of available active enzyme centers caused by formation of inactive enzyme-substrate complexes (the Holden theory), but rather the weakening of the catalytic properties of these centers resulting from change in enzyme structure. A kinetic equation is derived on this basis and is compared with experimental data.

ASSOCIATION: Sanitarno-gigiyenicheskiy meditsinskiy institut i Institut evolyutsionnoy fiziologii i biokhimii im. I. M. Sechenova AN SSSR, Leningrad (Medical Institute for Sanitation and Hygiene, and Institute of Evolutionary Physiology and Biochemistry, AN SSSR)

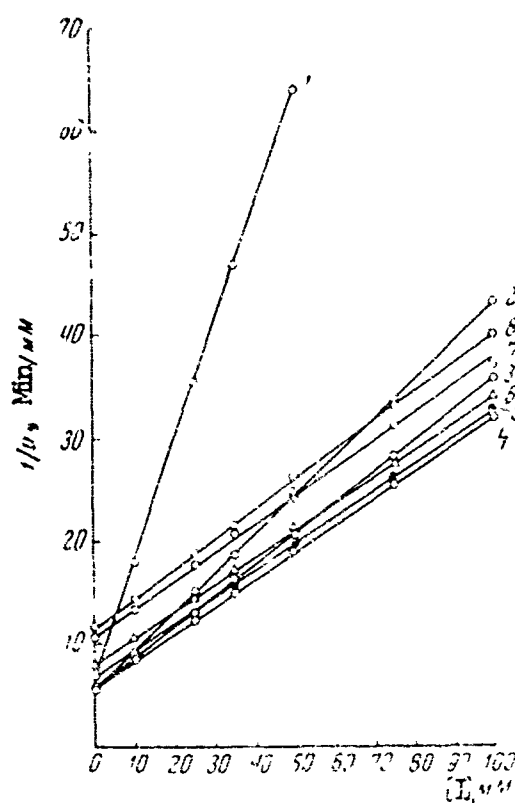


Fig. 1. Relation of $1/v$ to choline concentration $[I]$

Acetylcholine concentrations:
 1 - 1.8 m-mole; 2 - 4.5
 m-mole; 3 - 5.8 m-mole;
 4 - 7.16 m-mole; 5 - 9.65
 m-mole; 6 - 11.8 m-mole;
 7 - 16.1 m-mole; 8 - 17.3
 m-mole.

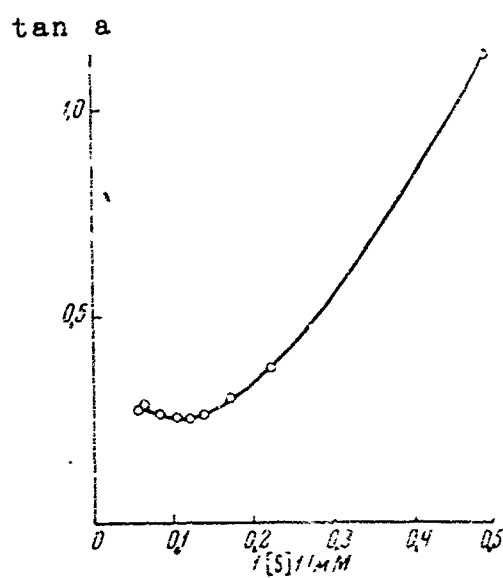


Fig. 2. Relation of $\tan a$ to $1/[S]$ according to experimental data

[EL]

IONITE FILTER GAS MASK

Bulikh, A. I., Yu. A. Shivandronov, M. K. Zagorskaya, and V. L. Bogatyrev. An ionite filter gas mask. Gigiyena i sanitariya, no. 1, 1966, 100-102.

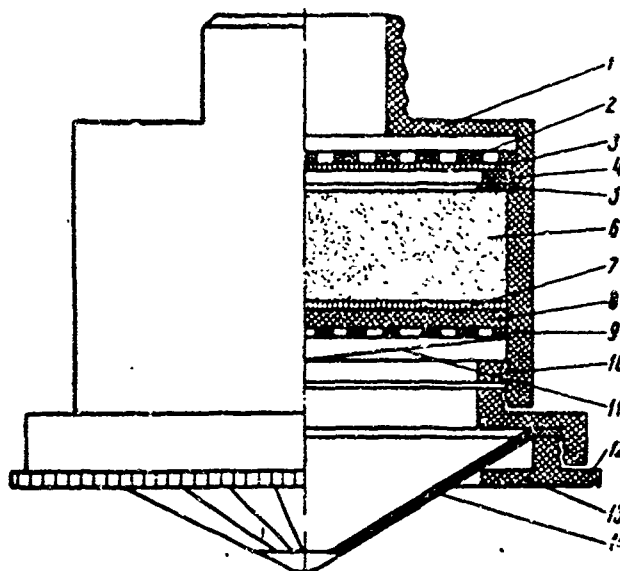
Since acid-base treatment of ionites renders them safe for use as drinking water filters, their gas filtration characteristics were tested to see if they can replace the usual substances used as industrial gas-mask filters (activated charcoal, silica gel, diatomite), which require complicated, bulky canisters and are inefficient and hard to regenerate.

A chemically active gas passed through a layer of ionite will dissolve in the water held by the ionite; this enables the gas molecules or ions of the compound formed by the reaction of the gas with the water to react with the ionite.

Absorption characteristics of each of the following ionites were determined using various concentrations (mixed with air) of the indicated gases at various flow rates: hydrogenated KU-2 cationite (absorption characteristics determined for ammonia, amines); hydroxy and carbonate forms of AV-17 and EDE-10P anionites (absorption of sulfur oxides, chlorine, and hydrogen chloride).

Mixtures of cationites and anionites can be used to obtain ion combinations which would not be possible in solutions or mixtures of salts: H^+ and OH^- , H^+ and CO_3^{2-} , $N_2H_5^+$ and OH^- , H^+ and $S_2O_3^{2-}$. Such ionite mixtures can simultaneously trap several gases and vapors with dissimilar chemical characteristics. An ionite layer which is sufficiently moist will also absorb aerosols, e.g., sulfur dioxide mists or ammonium chloride vapors. Highly ionized monofunctional resins (KU-2, OBS-3, SBV, and AV ionites) have the widest absorption ranges. Carboxyl cationites (KB-4) and anionites with secondary or tertiary amino groups (EDE-10P), which have a capacity of 8 to 9 g-eq/kg, are the most effective sorbents of strongly acid or basic gases. Highly porous ionites (KU-2P) are best against organic vapors and gases.

The illustrated ionite filter cartridge has been tested for several months against ammonia under industrial conditions. The 50-g KU-2 filter can absorb 3.5 g of ammonia, equivalent



Gas mask cartridge with ionite sorbent and moisture filter

1 - Vinyl plastic shell; 2, 9 - vinyl grids; 3 - capron screen; 4 - porolon washer; 5, 10 - vinyl washers; 6 - 20- to 30-mm layer of ionite; 7 - capron screen; 8 - perforated porolon filter; 11 - spring; 12, 13 - vinyl retaining ring; 14 - filter from RP-5 respirator.

to 30 hours of continuous protection at a gas concentration of 0.1 mg/liter. Practically, this means two weeks to a month of use before regeneration is required. Respiration resistance with this cartridge is no greater than with the standard "KD" type canister now used.

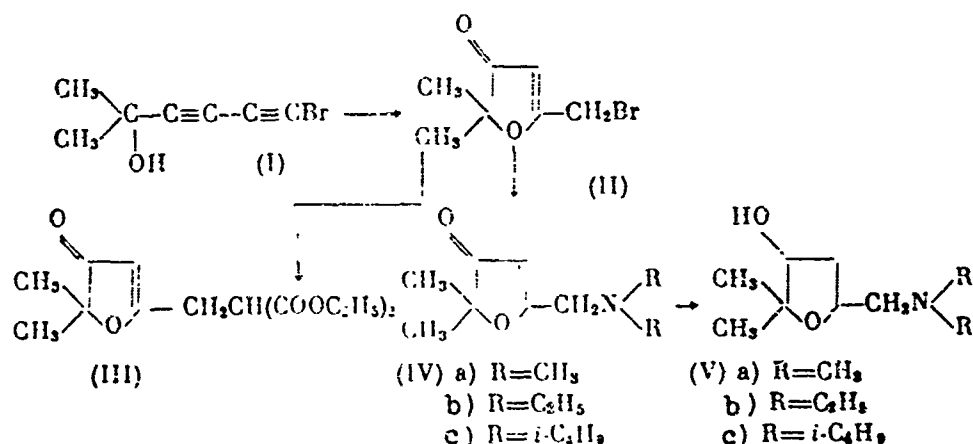
Further research will seek to find ionites, and combinations of ionites with physical and chemical sorbents, suitable for protection against a wide variety of substances, and to identify any compounds capable of harmful side reactions (other than neutralizing or binding reactions) with ionites.

ASSOCIATION: Novosibirskiy zavod khimicheskikh reaktivov;
 Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR
 (Novosibirsk Chemical Reagent Plant; Institute of Inorganic
 Chemistry, Siberian Department, Academy of Sciences SSSR)
 [DP]

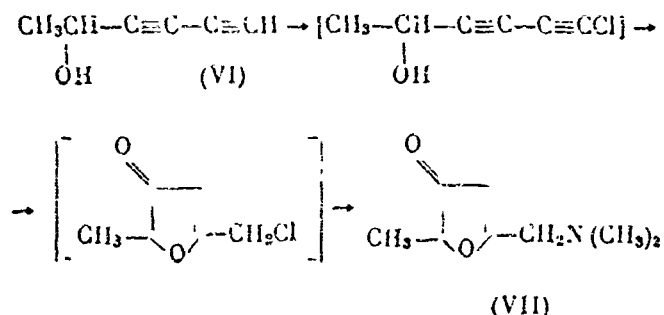
SYNTHESIS OF COMPOUNDS RELATED TO MUSCARINE

Gusev, B. P., I. I. Nazarova, and V. P. Kucherov. *Akademika nauk SSSR. Izvestiya. Seriya khimicheskaya*, no. 3, 1966, 566-566.

Previous work had shown that hydration of tertiary dia-
 cetylenic alcohols leads to the formation of 2,3-dihydro-
 3-furanone derivatives. It appeared of interest to apply
 this reaction to 1-bromo-5-methylhexa-1,3-dien-5-ol (I),
 since the expected product, dihydrofuranone (II), would
 provide an interesting intermediate for the synthesis of
 naturally occurring furane derivatives. It was found that
 under conditions of acid-catalyzed hydration, I is easily
 converted to 2,2-dimethyl-5-bromomethyl-2,3-dihydro-3-
 furanone in good yield. The structure of the latter com-
 pound was demonstrated by spectral data and by its reaction
 with sodiummalonic ester to form compound III. Compound II
 reacts with various secondary amines in good yield to form
 2,2-dimethyl-5-(dialkylaminomethyl)-2,3-dihydro-3-furanones
 which can be reduced with sodium borohydride or by hydro-
 genation over Raney nickel to muscarine analogs (V) con-
 taining an additional methyl group at C₂.



2-Methyl-5-(N-dimethylaminomethyl)-2,3-dihydro-3-furanone, the starting material for the synthesis of muscarine isomers, is prepared in the following manner:



ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry, Academy of Sciences SSSR) [VS]

SYNTHESIS OF NEW BASIC AMIDES OF α -ALKOXYDIPHENYLACETIC ACID

Klosa, J. *Journal für Praktische Chemie*, v. 4, no. 31, 1966, 14-19.

Synthesis of the basic amides was accomplished by one of two methods. In the first method, α -chlorobenziloyl chloride was allowed to react with N,N,N'-trimethylethylenediamine and N-alkylpiperazine in benzene or toluene to form the corresponding α -chlorobenzilamide hydrochlorides. The latter are boiled with the appropriate alcohols to replace the halogen by an alkoxy group. The second method consists of a reaction between α -alkoxybenziloyl chlorides and dialkylaminoalkylamines in anhydrous ether or benzene. This method has no particular advantages; the yields are barely 35%. The new amides with analgesic and spasmolytic activity are shown in the table below.

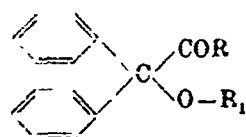


Table 1

Nr.	R	R ₁	Formula	M. W.	Calcd. N	Found N	m. p. °C	Base
VIII	$\begin{array}{c} \text{CH}_3 \\ \\ -\text{N}-(\text{CH}_2)_2-\text{N}- \\ \quad \quad \\ \text{CH}_3 \quad \text{CH}_3 \end{array}$	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_3$	$\text{C}_{22}\text{H}_{30}\text{N}_2\text{O}_2 \cdot \text{HCl}$	406,7	6,88	7,01	130-132	Oil
	(= A)							
XI	A	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}_2\text{H}_5$	$\text{C}_{22}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	420,7	6,51	6,58	128-130	Oil
X	A	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}_3\text{H}_7$ (iso)	$\text{C}_{24}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	434,8	6,45	6,50	154-156	Oil
XI	A	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}_4\text{H}_9$ (iso)	$\text{C}_{25}\text{H}_{36}\text{N}_2\text{O}_2 \cdot \text{HCl}$	448,8	6,44	6,51	110-112	Oil
XII	A	$-\text{CH}_2-\text{CH} \begin{array}{l} \text{C}_2\text{H}_5 \\ \text{C}_2\text{H}_5 \end{array}$	$\text{C}_{25}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	432,8	6,46	6,35	156-158	Oil
XIII	A	$-\text{CH}_2-\text{CH} \begin{array}{l} \text{CH}_3 \\ \text{C}_2\text{H}_5 \end{array}$	$\text{C}_{23}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	418,7	6,68	6,71	142-146	Oil
XIV	A	$-\text{CH}_2-\text{CH} \begin{array}{c} \text{CH}_3 \\ \\ -\text{CH}_2-\text{CH}-(\text{CH}_2)_2-\text{CH}_3 \end{array}$	$\text{C}_{28}\text{H}_{38}\text{N}_2\text{O}_2 \cdot \text{HCl}$	446,8	6,26	6,31	126-138	Oil
XV	A	$-\text{CH}_2-\text{C} \begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3 \end{array} -\text{CH}_2-\text{CH} \begin{array}{l} \text{CH}_3 \\ \text{CH}_3 \end{array}$	$\text{C}_{27}\text{H}_{36}\text{N}_2\text{O}_2 \cdot \text{HCl}$	460,8	6,07	6,15	116-118	Oil
XVI	A	$-\text{CH}_2-\text{CH}_2-\text{C}_6\text{H}_5$	$\text{C}_{27}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	452,8	6,18	6,22	92-94	Oil
XVII	$\begin{array}{c} \text{CH}_3-\text{CH}_2 \\ \quad \quad \\ -\text{N} \quad \quad \text{N}-\text{CH}_3 \\ \quad \quad \\ \text{CH}_3-\text{CH}_2 \end{array}$	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_3$	$\text{C}_{22}\text{H}_{30}\text{N}_2\text{O}_2 \cdot \text{HCl}$	404,7	6,91	7,05	214-216	150-16
	(= B)							
XVIII	B	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}_2\text{H}_5$	$\text{C}_{22}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	418,7	6,68	6,75	205-207	158-160
XIX	B	$-\text{CH}_2-\text{CH} \begin{array}{l} \text{C}_2\text{H}_5 \\ \text{C}_2\text{H}_5 \end{array}$	$\text{C}_{25}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	446,8	6,26	6,35	228-230	140-142
XX	B	$-\text{CH}_2-\text{CH} \begin{array}{l} \text{CH}_3 \\ \text{C}_2\text{H}_5 \end{array}$	$\text{C}_{24}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	416,7	6,71	6,80	236-238	-
XXI	B	$-\text{CH}_2-\text{C}_6\text{H}_5$	$\text{C}_{28}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	436,8	6,40	6,37	230-232	-
XXII	B	$-\text{CH}_2-\text{CH}_2-\text{C}_6\text{H}_5$	$\text{C}_{27}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	450,8	6,20	6,15	222-224	-
XXIV	$\begin{array}{c} \text{CH}_3-\text{CH}_2 \\ \quad \quad \\ -\text{N} \quad \quad \text{N}-\text{C}_2\text{H}_5 \\ \quad \quad \\ \text{CH}_3-\text{CH}_2 \end{array}$	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{CH}_3$	$\text{C}_{22}\text{H}_{30}\text{N}_2\text{O}_2 \cdot \text{HCl}$	418,7	6,68	6,63	228-230	-
	(= C)							
XXV	C	$-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}_2\text{H}_5$	$\text{C}_{24}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	432,8	6,46	4,51	212-214	-
XXVI	C	$-\text{CH}_2-\text{CH} \begin{array}{l} \text{C}_2\text{H}_5 \\ \text{C}_2\text{H}_5 \end{array}$	$\text{C}_{26}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	444,8	6,29	6,34	224-226	-
XXVII	C	$-\text{CH}_2-\text{CH} \begin{array}{l} \text{CH}_3 \\ \text{C}_2\text{H}_5 \end{array}$	$\text{C}_{25}\text{H}_{34}\text{N}_2\text{O}_2 \cdot \text{HCl}$	430,8	6,49	6,53	238-240	-
XXVIII	C	$-\text{CH}_2-\text{C}_6\text{H}_5$	$\text{C}_{27}\text{H}_{32}\text{N}_2\text{O}_2 \cdot \text{HCl}$	450,8	6,20	6,23	220-222	-

CIVIL DEFENSE ORGANIZES ABC WEAPONS OBSERVATION POSTS

Medvedev, V. Voyennyye znaniya, no. 4, 1966, 27-28.

Soviet civil defense is organizing 3-man observation teams to be trained in the observation and reporting of atomic, bacteriological, and chemical weapons use. Observation posts will be set up in populated and industrial areas. The DP-2 roentgenmeter will be used to record radioactive contamination. Chemical and bacteriological weapons will be identified on the basis of external characteristics.

[DM]

GDR GENERAL ON USE OF CHEMICALS IN VIETNAM

Neues Deutschland, 21 Apr 1966, 11, col. 6.

Military physicians of the GDR Army, including Major General Prof. Gestewitz, protest the use of chemical warfare weapons in Vietnam by US Forces and trace their use as follows: First it was the use of the herbicides 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), which were used from August 1961 in a "weed killing campaign" to destroy agricultural crops and starve the populace. The next step was the use of the caustic herbicide calcium cyanide, which damages the skin and tissue of humans and animals, and 2,4-dinitrophenol (DNP) and 4,6-dinitroorthocresol (DNOC). DNP and DNOC attack the metabolic process. Next came arsenic compounds: arsenic trioxide, arsenites, and arsenates. Now CN, CS, and DM: CN is chloroacetophenone, CS is probably o-chlorobenzalmononitrile, and DM is adamsite or phenarsinachlorid, a lung irritant.

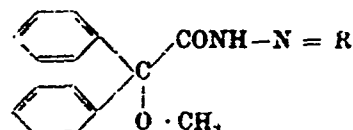
[DM]

SYNTHESIS OF α -ALKOXYBENZILOYL HYDRAZIDES

Klosa, J. *Journal für Praktische Chemie*, v. 4, no. 31, 1966. 20-23.

In connection with the synthesis of spasmolytic esters and amides of benzoic acid, the question arose concerning the effect of the hydrazides of this class of compounds. The hydrazides were prepared by boiling benzilate esters with hydrazine hydrate. The yields were 60—80%. The hydrazides with lower alkoxy groups crystallized easily; those with higher alkoxy groups precipitate as oils which crystallize only on standing for several days. The hydrazides can be converted by boiling with aldehydes or ketones to easily crystallizable hydrazones.

Table 1




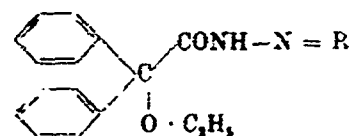
Nr.	R	Formula	M.W.	N in %		m.p. °C
				Calcd.	Found	
II	$\text{CH}_3-\text{CH}=\text{CH}-$	$\text{C}_{17}\text{H}_{19}\text{N}_2\text{O}_3$	282,1	9,92	10,06	153—155
III	$\begin{array}{c} \text{H}_2\text{C} \\ \text{H}_2\text{C} \end{array} \text{CH}-\text{CH}=\text{CH}-$	$\text{C}_{19}\text{H}_{21}\text{N}_2\text{O}_3$	310,2	9,03	7,17	198—200
IV	 -CH=	$\text{C}_{22}\text{H}_{23}\text{N}_2\text{O}_3$	344,2	8,11	8,24	201—203
V	$\text{H}_3\text{C}-\text{O}-\text{C}_6\text{H}_4-\text{CH}=\text{CH}-$	$\text{C}_{23}\text{H}_{25}\text{N}_2\text{O}_4$	374,2	7,48	7,52	234—236
VI	$\text{H}_3\text{C}-\text{O}-\text{C}_6\text{H}_4-\text{CH}=\text{CH}-$	$\text{C}_{24}\text{H}_{27}\text{N}_2\text{O}_4$	404,3	6,93	7,07	254—256
VII	$\begin{array}{c} \text{H}_3\text{C}-\text{O} \\ \\ \text{C}-\text{C}_6\text{H}_4-\text{CH}=\text{CH}- \\ \\ \text{H}_3\text{C}-\text{O} \end{array}$	$\text{C}_{25}\text{H}_{29}\text{N}_2\text{O}_5$	388,2	7,21	7,28	236—238
VIII	$\text{HO}-\text{C}_6\text{H}_4-\text{CH}=\text{CH}-$	$\text{C}_{22}\text{H}_{21}\text{N}_2\text{O}_3$	360,2	7,77	8,74	252—254
IX	$\text{Cl}-\text{C}_6\text{H}_4-\text{CH}=\text{CH}-$	$\text{C}_{22}\text{H}_{19}\text{ClN}_2\text{O}_3$	378,7	7,36	7,47	253—255

Table 1 (Cont.)

Nr.	R	Formula	M. W.	N in % Calcd.	Found	m.p. °C
X		$C_{12}H_{11}N_2O_4$	389,3	10,77	10,84	238-240
XI		$C_{14}H_{15}N_2O_4$	372,2	7,52	7,58	96-98
XII	$C_6H_5-CH_2-CH_2-CH=$	$C_{12}H_{13}N_2O_4$	372,2	7,62	7,71	150-152
XIII		$C_{11}H_{10}N_2O_4$	344,2	12,20	12,34	158-170
XIV		$C_{11}H_{10}N_2O_4$	344,2	12,20	12,28	238-240
XV		$C_{11}H_{10}N_2O_4$	344,2	12,20	12,31	222-224
XVI		$C_{12}H_{11}N_3O_6$	379,2	11,08	11,32	256-258
XVII		$C_{17}H_{22}N_4O_4$	454,3	12,33	12,51	Decomp. 130-132

Table 2



Nr.	R	Formula	M. W.	N in % Calcd.	Found	m.p. °C
XIX	$CH_3-CH=$	$C_{13}H_{13}N_2O_4$	296,1	9,45	9,57	58-60
XX		$C_{13}H_{13}N_2O_4$	358,2	7,82	7,94	158-160
XXI		$C_{14}H_{15}N_2O_5$	388,2	7,21	7,28	188-190
XXII		$C_{14}H_{15}N_2O_5$	418,3	6,69	7,04	173-175
XXIII		$C_{13}H_{13}N_2O_5$	374,2	7,48	7,52	230-232
XXIV		$C_{13}H_{11}ClN_2O_4$	392,8	7,13	7,28	221-223
XXV		$C_{14}H_{15}N_2O_5$	402,3	6,96	7,17	154-156
XXVI		$C_{13}H_{11}N_3O_4$	403,3	10,42	10,48	175-177
XXVII	$C_6H_5-CH_2-CH_2-CH=$	$C_{13}H_{13}N_2O_4$	386,2	7,25	7,28	118-120

AMMONIA PROCESSING

Szanto, Andras. *Magyar Kemikusok Lapja*, v. 21, no. 2, 1966, 83-91.

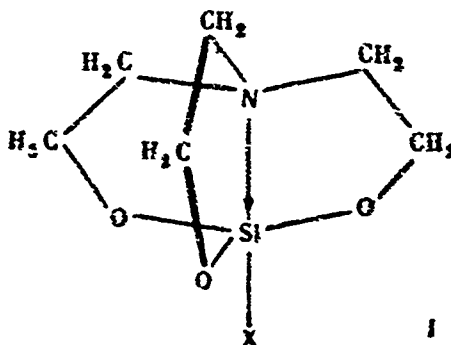
During the past five years, world production of nitrogen has increased 65%. The trend in the fertilizer industry is towards an increase in complex and high concentration products. Hungary's nitrogen industry follows these characteristics. Ammonium nitrate and urea are being produced in increased quantities and during the next Five Year Plan, production of dual fertilizer will be based on domestic technology. In Hungary's new plants, processing of ammonia will be limited primarily to the production of nitric acid, ammonium nitrate, and urea. The technology of these processes is discussed in this paper. Units of greater production capacities are foreseen for the near future because investment and operating costs will be proportionately lower and because of the steadily growing demand for these products.

ASSOCIATION: Vegyipari Troszt (Chemical Industrial Trust)
[KS]

ATRANES VI. INFRARED ABSORPTION SPECTRA OF SILATRANES

Yegorov, Yu. P., M. G. Voronkov, T. B. Lutsenko, and G. I. Zelchan. *Khimiya geterotsiklicheskikh soyedineniy*, no. 1, 1966, 24-33.

The spectra of ten silatranes in the region $400-1700\text{ cm}^{-1}$ were investigated:



where $X = H, CH_3, C_2H_5, (CH_3)_2CH, CH_2=CH, C_6H_5, C_2H_5O, n-C_{14}H_{29}O, C_6H_5O,$ or $p-CH_3C_6H_4O$. The presence of the coordinate bond $N \rightarrow Si$ in these compounds is not reflected in the fundamental vibrational frequencies of the central silicon atom, nor in the frequencies of the internal vibrations of substituent X . All IR spectra, however, show an absorption band at 570 cm^{-1} , apparently related to bond deformations $\nu(N \rightarrow Si)$. This could also be the frequency $\nu(Si-O)$ of the $XSi(O)_3$ group, shifted downward by the interaction between bonds $Si-O$ and $Si-N$. The existence of this bond is also supported by the shift of the $\nu(Si-H)$ frequency in the silatrane ($X=H$) spectrum.

ASSOCIATION: Institut khimii vysokomolekulyarnykh soyedeneniy Akademii nauk UkrSSR, Kiev (Institute of Chemistry of High-Molecular-Weight Compounds, Academy of Sciences UkrSSR); Institut organicheskogo sinteza Akademii nauk Latviyskoy SSR, Riga (Institute of Organic Synthesis, Academy of Sciences Latvian SSR) [VS]

II. BIOLOGICAL FACTORS

CHANGE OF SEROLOGICAL AND ANTIGENIC PROPERTIES OF PATHOGENIC LEPTOSPIRA IN EXPERIMENTAL CONDITIONS. COMMUNICATION I.

Anan'in, V. V., and L. P. Semenova. *Zhurnal mikrobiologii, epidemiologii i immunobiologii*, no. 3, 1966, 34-39.

Prolonged growth on a medium with immune sera (18 months, 23 transfers) led to profound changes in the serological properties of *Leptospira* of the pomona group. The agglutination-lysis reaction with changed cultures of this serological group and with immune sera against the initial strains was positive to 3% of homologous titer. Reaction with initial strains and sera against changed strains was positive from 0.1 to 10% titer.

Serological P.S.P. variant, a standard pomona strain grown on the medium with homologous immune serum lost close antigenic affinity with the original strain. According to cross antibody absorption tests, P.S.P. was an individual serological type.

Changes in serological type described are the basis for selecting *Leptospira* resistant to the action of specific antibodies.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei AMN SSSR (Institute of Epidemiology and Microbiology AMN SSSR) [LP]

EFFECT OF VOLGA DAM ON DIPTERA

Andreyeva, N. L. Changes in seasonal prevalence of Diptera Simuliidae in Volga flood plain related to construction of the Volga Hydroelectric Power Station imeni Twenty-Second Party Congress. *Meditinskaya parazitologiya i parazitarnyye bolezni*, no. 1, 1966, 19-23.

Because of seasonal changes and changes in work schedules of the hydropower station, the water level in the tail race of the Volgograd reservoir varies sharply. The result is that breeding conditions for black flies have deteriorated since the station was built, and as of 1962 the fly population was one-seventh of its level in 1958, when the Volga-Akhtyba Canal was favorable for growth in the fly population. The flies are most prevalent in June after the spring rains, and *Titanopteryx maculata* Mg. and *Schönbaueria matthiesseni* are most common in the Volga-Akhtyba Canal.

ASSOCIATION: Parazitologicheskii otdel Volgogradskoy oblastnoy sanepidstantsii (Parasitology Department of the Volgograd Provincial Sanitation and Epidemiology Station)
[LP]

BLACK FLIES IN THE UPPER KAMA REGION

Arkhipova, G. A. Age composition of bloodsucking black flies in the Upper Kama region. *Meditinskaya parazitologii i parazitarnyye bolezni*, no. 1, 1966, 6-11.

Physiological age was determined by number of ovary tubule extensions in female flies. Among bloodsucking species in the northern Gainsk district of the Perm region, females with more than one egg laying were in the minority, although *S. morsitans longipalpe* Belt. and *S. verecundum* Stone performed three or four cycles. In one year two generations of *S. morsitans* and *S. galleratum* and three generations of *S. verecundum* develop.

ASSOCIATION: Kafedra zoologii bespozvonochnykh Perm-skogo gosudarstvennogo universiteta (Department of Invertebrate Zoology, Perm State University)
[LP]

ACTION OF ACTINOMYCETES ON SOIL BACTERIA

Bryanskaya, A. M. Antagonistic effect of actinomycetes on pathogenic soil bacteria. Gigiyena i sanitariya, no. 1, 1966, 104-105.

Sterile soil from irrigated fields near Kiev and cells from cultures of *Salmonella paratyphi B*, *Salmonella typhimurium* or Flexner dysentery bacteria were incubated for five days with actinomycetes in liquid media at 28°C. Periodic aliquots were taken, suspended in water, and grown on synthetic agar for actinomycetes and on a second medium for revealing the test bacteria. Colonies were counted after 24 hours. Five of seven actinomycetes species showed strong bacteriostatic action on *Salmonella paratyphi*, *Salmonella typhimurium* and Flexner bacteria in soil. *Act. acrimycinii* and *act. violascens* were the most successful antagonists.

ASSOCIATION: Kiyevskiy institut epidemiologii i mikrobiologii (Kiev Institute of Epidemiology and Microbiology)
[LP]

DIFFERENTIATION OF BACILLUS ANTHRACIS

Chang, Hsiao-ch'i, and Cu'iao-li, Ts'ao. The differentiation of bacillus anthracis from other aerobic sporeforming bacilli. Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 12, no. 1, 1966, 55-63.

Forty-three strains of *Bacillus anthracis*, 33 strains of other aerobic sporeforming bacilli, and 212 unknown strains of aerobic sporeforming bacilli were included in this study.

1. "String of pearls" Test: 95.3% were positive among 43 strains of known *B. anthracis*, and 92.5% of 80 unknown strains. All other 165 strains of aerobic sporeforming bacilli were negative. It is concluded that this test can differentiate *B. anthracis* from other aerobic sporeforming bacilli.

2. Lysis by W bacteriophage: Forty-three known strains and 80 unknown strains of *B. anthracis* were susceptible to this phase, while only one strain of *E. cereus* among 132 unknown strains was susceptible.

3. Growth on sodium bicarbonate medium under CO_2 : Of 4 known strains of *B. anthracis*, 36 highly virulent strains, and 78 strains of 80 unknown strains produced mucoid colonies; 165 strains of other aerobic sporeforming bacilli did not produce mucoid colonies. This test can therefore also be applied to the differential identification and the primary diagnosis of virulent *B. anthracis*.

4. *B. anthracis* could not grow on penicillin agar, showed no motility and hemolysis and could not ferment salicin. Other aerobic sporeforming bacilli showed different results. Therefore, these methods can be applied as accessory tests for differential identification.

Besides the colony appearance and biochemical reactions, the following tests were also helpful in the differentiation of this group of organisms: *B. anthracis* could not ferment salicin, *B. sphaericus* was negative in all biochemical reactions, and the other aerobic sporeforming bacilli showed different results. "Wang Mei-hsian was the director."

[CR]

MANGANESE-SPECIFIC BACTERIA

Daraceliya, N. A., and T. G. Rtskhiladze. The presence of specific "manganese" bacteria in the soil of the Chiatursk ore deposit. IN: *Akademiya nauk Gruzinskoy SSR. Soobshcheniya*, no. 3, 1966. 687-691.

Bacteria from the genus *Chromobacterium* were isolated from the soils of the Chiatursk manganese deposit and were found to have the ability to dissolve insoluble manganese carbonate under laboratory conditions. These gram-negative bacteria were given the classification *Chromobacterium manganicum* and their role in the soils of the Chiatursk manganese deposit is being investigated.

ASSOCIATION: Institut pochvovedeniya, agrokhimii i melioratsii (Institute of Soil Science, Agrochemistry, and Reclamation)

[LP]

FLIGHT OF PHLEBOTOMUS FROM RHOMBOMYS OPIMUS COLONIES

Dergacheva, T. I. *Meditssinskaya parazitologiya i parazitarnyye bolezni*, no. 1, 1966, 43-48.

To determine regularities and modes of leishmaniasis transmission from a reservoir in a colony of *Rhombomys opimus* in the Guzav district of the Kashkadarya region of the Uzbek SSR to humans via phlebotomus, distribution of phlebotomus species in and around the colony was studied. Of 8 species captured in the colony, *Sergentomyia arpaklensis*, *S. grekovi*, *Phlebotomus papatasi*, and *Ph. caucasicus* were most prevalent, while *S. arpaklensis* and *Ph. papatasi* were captured outside the colony most often. Mainly males and eggless females migrated. Females with eggs and blood were seldom caught. Distribution of flies depended on the topography of the locality. Flies migrated radially from colonies in flat terrain and flies from hillside communities usually accumulated at the foot of the slope where they were protected from wind.

ASSOCIATION: Entomologicheskii otdel instituta meditsinskoy parazitologii i tropicheskoy meditsiny im. Ye. I. Martsinovskogo Ministerstva zdoravookhraneniya SSSR, Moskva (Entomology Department, Institute of Medical Parasitology and Tropical Medicine, Ministry of Health, SSSR) [LP]

FUNGUS DISEASES OF FRUIT SPECIES IN TURKMENIA

Frolov, I. P. IN: *Akademiya nauk Turkmeniskoy SSR. Izvestiya*, no. 1, 1966, 34-41.

From 1963—1965 the distribution, appearance, and causative organisms of fruit diseases were investigated. Phyllostictosis of apple and pear leaves, quince rust, pear spot, pulp rot in apples, and blue fruit rot appear rarely in Turkmenia but these and other diseases are scientifically interesting. Therefore, microscopic characteristics are described for *Sphaeropsis malorum* Peck, *Venturia maegualis* Cooke, *Venturia pirina* Aderh.—fruit and leaf parasites; *Fusicladium dendriticum* and

Fusicladium pirinum — parasites in the conidial stage on pear and apple trees; *Podosphaera leucotricha* Salm., *Phyllactinia sufflata*, *Septoria piricola* Desm., and *Gymnosporangium fusicolorum* Fisch. — leaf and shoot parasites. In early spring, *Gymnosporangium confusum* teleutospores develop in juniper, (*Juniperus turcomanica*). White apple rot caused by *Inonotus hispidus*, phyllostictosis caused by *Phyllosticta briardi*, and clasterosporosis caused by *Clasterosporium carpophilum* are described, as well as diseases caused by *Ascochyta pirina*, *Mycosphaerella bellona*, *penicillium glaucum*, and *Aspergillus niger*.

ASSOCIATION: Institut botaniki AN Turkmenskoy SSR (Institute of Botany, Academy of Sciences Turkmen SSR) [LP]

STACHYBOTRYOTOXICOSIS ON CATTLE FARMS

Gdovin, T., E. Sianina, L. Vrzgula, and A. Michna. Veterinarstvi, v. 16, no. 4, 1966, 152-156.

A mass outbreak of stachybotryotoxicosis was observed on two large cattle farms during the winter. The disease is accompanied by high temperature (41°—42°C), gastroenteritis, and severe icterus. Death occurred after failure of the cardiovascular system. In the cases observed the following laboratory findings were characteristic: increased hemocoagulation, severe leucopenia (in 91% of cases) with marked lymphocytosis, neutropenia, and aneosinophilia. Fibrogen was found to be substantially increased, and blood serum proteins markedly decreased (hypoproteinemia). Blood serum protein fractions did not show any particular deviations, and total bilirubin in the blood was increased (as much as 2 mg%). The calcium reserves in the blood were decreased, which was considered to be a conditioning factor. The mineral levels were decreased, while alkaline phosphatase activity increased. Symptomatic therapy, which is effective only when administered at the onset of the disease, is described. [EL]

THE PLACE OF NEWCASTLE BACILLI IN SHIGILLA CLASSIFICATION

Gekker, V. D., Ye. D. Ravich-Birger, and Yu. A. Belaya.
Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 1,
1966, 17-19.

International classification places Newcastle bacteria in the same subgroup as Flexner 6 types while Soviet classification places them in a subgroup of the Flexner type, based on their differing fermentative properties and their similar serological properties. Immunoelectrophoretic analysis shows that Newcastle bacilli belong in a special subgroup of Shigella. A basic criterion in settling this dispute was clarification of their antigenic structures. Using immunoelectrophoresis to study microbial antigens in the undamaged cell, the authors investigated antigenic structure in 6 Flexner strains, 16 Boyd strains, and 16 Newcastle strains. Soluble antigens were obtained from living bacteria of each strain. In immunoelectrophoresis, Flexner antigens migrated toward the cathode and Boyd antigens to the anode as did Newcastle antigens, showing close relationship between the Newcastle and Boyd types. Newcastle bacteria also have an antigen, which, with Flexner somatic antigen, moves toward the cathode.

ASSOCIATION: Institut epidemiologii i mikrobiologii im.
Gamalei AMN SSSR (Institute of Epidemiology and Microbiology
AMN SSSR) [LP]

POISONING PRODUCED BY HONEY

Glushkov, P. M. *Gigiyena i sanitariya*, no. 1, 1966, 78-79.

Spring honey obtained from Korean rhododendron blossoms by bees is a possible cause of food poisoning. The Korean rhododendron, prevalent in swamps, contains a poisonous substance which appears in honey and has the composition $C_{31}H_{50}O_{10}$. In May, 1964 a medical team in the Kuybyshev region of Novosibirsk oblast ate fresh honey. One of them showed severe symptoms of poisoning which disappeared after two days; others who had eaten less showed less grave symptoms. No symptoms were seen in citizens of a village about two km from a swamp where large numbers of rhododendrons grew although poisoning had been reported in the past.

ASSOCIATION: Kuybyshevskaya gorodskaya sanepidstantsiya
Novosibirskoy oblasti (Kuybyshev Municipal Health Station,
Novosibirsk Oblast) [LP]

INHIBITORY EFFECT OF INTERFERON RIBONUCLEIC ACIDS OF POLIOMYELITIS AND LOUPING ILL VIRUSES

Ivanova, N. A., and R. Ya. Polyak. Voprosy virusologii,
no. 1, 1966, 31.

Interferon obtained from a chick fibroblast culture infected with Japanese encephalitis slowed synthesis of louping ill virus, lowering its yield from cells infected with the intact virus or its RNA, and blocked the infectious process induced by poliovirus RNA in a nonsensitive chick fibroblast culture. Direct contact of interferon with these infectious viral RNA's caused their biological inactivation as shown by suppression of homologous virus reproduction after infection of animal or tissue cultures, where interferon could not exert an additional action on virus particle synthesis.
[LP]

INTERFERON FORMATION IN CHICK EMBRYO

Ivanova, N. A. Interferon formation conditions in a chick embryo fibroblast tissue culture infected with Japanese B encephalitis virus. Byulleten' eksperimental'noy biologii i meditsiny, no. 2, 1966, 75-77.

Only biologically active Japanese B encephalitis virus induced interferon formation in a chick embryo fibroblast tissue culture monolayer. Interferon formed in infected chick fibroblast cells quickly passed into the surrounding fluid medium and did not accumulate in the cells. Large doses of heat-inactivated virus did not induce interferon formation in the cells. Preliminary interferon treatment of tissue culture before infection decreased rather than increased fresh interferon production.

ASSOCIATION: Otdel virusologii (Zav.—chlen-korr. AMN SSSR
Prof. A. A. Smorodintsev) Instituta eksperimental'noy
meditsiny AMN SSSR, Leningrad (Department of Virology,
Institute of Experimental Medicine, AMN SSSR) [LP]

FREE RADICALS AND VIRUS REPRODUCTION

Kalichava, G. S., and L. N. Loginova. Effect of inhibitors on free radical processes in tobacco mosaic virus reproduction. IN: Akademiya Nauk Gruzinskoy SSR. Soobshcheniya, no. 3, 1966, 693-695.

A homogenate of tobacco leaves infected with tobacco mosaic virus was used to infect *Chenopodium amaranticolor*, *Nicotiana glutinosa*, and *Datura shomonium*. Propylgallate (normal propyl ester of gallic acid) and ethylgallate (ethyl ester of gallic acid) in varying concentrations were used as inhibitors. Infected leaves were placed in petri dishes containing inhibitor. After exposure, virus titer was determined by standard methods. Propylgallate and ethylgallate lowered virus concentration in the plants tested. It is theorized that free radicals are the active centers of oxidation-reduction reactions and are connected with the reproduction of viruses in host tissues and, therefore, that anti-free radical agents are effective against viruses.

ASSOCIATION: Institut zashchity rasteniy, Tbilisi (Plant Protection Institute) [LP]

IDENTIFYING TETANUS ANTITOXIN USING THE INDIRECT HEMAGGLUTINATION REACTION

Kamakov, I. I. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 1, 1966, 103-108.

Identification of various sera in tetanus antitoxin using the indirect hemagglutination reaction was studied. Sheep erythrocytes, stored 7—30 days in Migulina's solution,

standard antitetanus serum prepared at the State Control Institute for Medical and Biological Preparations, and human blood from young adults, before and after injection of NIISI polyvaccine prepared at the Tashkent Vaccine and Serum Institute, were used. Results of studying human sera before, immediately after, and one month after vaccination and after one, two, and three revaccinations by this method correspond with other published results of effectiveness tests for various antitetanus vaccination plans. [LP]

BIOLOGICAL CONTROL OF AGRICULTURAL PESTS

Katsura, A. *Zashchita rastenii*, no. 2, 1966, 18.

The Biological Laboratory of the Moscow Plant Protection Station was organized in 1964 to study useful soil organisms, to develop biological pest control methods for use with chemical and agrotechnical measures (such as the use of *Trichogramma* in insect pest control), and to manufacture murine typhus preparations. Various Chalcididae, Hymenoptera parasitic on eggs, larvae and pupae of cabbage moths, apple leaf moths, and others, were successfully used in pest control tests, as were predators for control of aphids. Small doses of insecticide used with soil bacteria reduced codling moth population at a test site. *Trichogramma*, which multiplies in grain moth eggs, was raised in barley fields and controlled cabbage and other moths. It has also been used in conjunction with chemical treatment of seeds and fields. In 1965, preparations of several tons of murine typhus bacteria Isachenko strain 5170, were made at this and other laboratories, and were used in agriculture.

[LP]

EFFECT OF CHLORAMPHENICOL ON STREPTOCOCCI

Klimov, A. N., I. M. Tereshin, and O. A. Malyuga. Effect of chloramphenicol on transformation of streptomycin resistance in streptococci. *Antibiotiki*, no. 3, 1966, 222-227.

The effect of chloramphenicol, a specific inhibitor of protein synthesis, on the transformation of streptomycin in streptococci was studied. Transformation is used in classifying bacteria, evaluating biological activity of DNA preparations, etc., and is most significant in investigating the possibility that sensitivity or resistance to antibiotics occurs as a result of bacterial transformation.

Organisms in which such transformations have been investigated are listed below:

pneumococci
streptococci
Staph. aureus
Meisseria meningitidis
E. coli
Mycobacterium avium
Haemophilus influenzae
Salm. typhimurium
Brucella sp.
Shigella flexner

In this experiment, addition of chloramphenicol in sub-bacteriostatic concentrations to a culture of *Str. haemolyticus* Challis strain in the first stage of competence development completely suppressed development of competent cells. When added simultaneously with transforming DNA it lowered the number of transformants. The degree of inhibitory action of chloramphenicol depended on its concentration. The greatest effect was observed at a concentration of 2 µg/ml. Although it reduces development of transformation, chloramphenicol does not affect the degree of resistance to streptomycin in the transformants that do appear, or the phenotypic expression of streptomycin resistance in *Streptococcus haemolyticus*.

ASSOCIATION: Leningradskiy nauchno-issledovatel'skiy institut antibiotikov Ministerstva zdravookhraneniya SSSR (Leningrad Scientific Antibiotic Research Institute, Ministry of Health SSSR) [LP]

PSYCHOSES DURING TOXOPLASMOSIS

Klyuyeva, T. D., Ye. N. Samodumskaya, and T. M. Tikhovskaya. *Zhurnal neuropatologii i psikhiatrii im. S. S. Korsakova*, v. 54, no. 3, 1966, 454-458.

Results of observing six patients with congenital and two patients with acquired toxoplasmosis show that the psychoses induced by toxoplasmosis are characterized by progressively developing polymorphic pathological symptoms. At advanced stages of psychosis, convulsive paranoid and catatonic symptoms, atypical dull states, slow wittedness, and depression appear. Finally, variable dementia, slowness to the point of apathy — interrupted from time to time by convulsions or impulsive psychomotor excitation — appear.

ASSOCIATION: Respublikanskaya psikhiatricheskaya bol'nitsa No. 1 (glavnyy vrach B. A. Morozov, nauchnyy rukovoditel' — Prof. A. N. Molokhov) (First Psychiatric Hospital of the Republic); Moldavskiy nauchno-issledovatel'skiy institut gigiyenyi epidemiologii (Dir. A. P. Diskalenko), Kishinev (Moldavian Scientific Research Institute of Hygiene and Epidemiology) [LP]

INFECTIOUS ALLERGY. REPORT ONE. INFECTIOUS ALLERGY TO DIPHTHERIA EXOTOXIN AS A FUNCTION OF THE INTERVALS BETWEEN INJECTIONS.

Kravchenko, A. T., and L. I. Privalova. Zhurnal microbiologii, epidemiologii i immunobiologii, no. 3, 1966, 94-99.

Death from acute intoxication produced by diphtheria exotoxin occurred earlier in guinea pigs when successive low doses were administered than when a single lethal injection was given. The interval between injections and time of death were shown to be directly related. When 20—22 0.01-Dlm doses were given at one-hour intervals, death occurred 3—4 days after the first dose; when doses of like number and strength were administered at 24-hr intervals, death occurred after 22—25 days. This also showed a direct relation between number of exotoxin injections and death by acute intoxication.

ASSOCIATION: Kontrol'nyy institut meditsinskikh biologicheskikh preparatov im. Tarasevicha, Moscow (Control Institute for Medical-Biological Preparations) [LP]

METHOD OF DIAGNOSING AFRICAN SWINE PLAGUE

Kryukov, N. N., V. N. Syurin, B. I. Surin, N. R. Zorina, and Z. L. Sorvacheva. Izobreteniya, Promyshlennyye obraztsy, Tovarnyye znaki, no. 5, 1966, 57.

A method of diagnosing African swine plague is distinguished by its rapidity. Blood is taken, heparinized, placed in poly(vinyl alcohol), and centrifuged. A cysteine pentone solution is added to the leucocytes obtained. Hemadsorption on the leucocytes is observed after 1 to 3 days incubation at 37°C. [LP]

PASTEURELLOSIS OF CATTLE

Lavicka, M. Pasteurellosis of cattle caused by Pasteurella haemolytica microbes. Veterinarstvi, v. 16, no. 4, 1966, 182-183.

A case of pasteurellosis in cattle on a school farm in Czechoslovakia in 1964 is described. Fifty-seven of 133 cows and a number of calves were affected. One cow and one calf died before the proper diagnosis was established and vaccination treatment applied. Respiration with heavy asphyxia and temperature in excess of 40°C were the principal symptoms observed in fatally sick animals. All other sick stock displayed heavy cough and increased temperatures which subsided in a week following vaccination of all animals with a bronchopneumonia serum (50—150 millilitres) and clinical application of penicillin to the sick. The following pathological anatomical findings were made on the thoracic and cardiac organs of the deceased cow: hypertrophic, stiff lungs with marbled parenchymae and hepatic deposits of red and grey color observed on sections; septa between lobes greatly enlarged with serositic infiltrations; peribronchial lymph glands also greatly enlarged. The process had already progressed into the apical, cardiac, and one-third of the diaphragmal lobes. Changes in the heart, and serositic infiltration of the hypodermic flesh in the areas of the esophagus, larynx, and trachea were established.

Histological examination of the lungs showed advanced pneumonia manifested by a characteristic pattern of fibrinous exudate, and inflamed leuco- and lymphocytotic elements in alveoli. Minor abscesses were noted in the vicinity of vessels, notably the branches of the pulmonary artery. The attacked vessels of both bronchial and pulmonary systems showed signs of fibrinoidal necrosis and moderate arteritis of secondary origin. Suppurative and suppurative-ulcerous bronchitis and bronchiolitis were noted in small and large cartilaginous bronchi. Bipolar ovoid rods were discovered by microscopic examination of lung and heart tissue. The cultures transplanted from the lungs onto meat-peptone agar and haematic agar grew within 48—72 hours into large colonies of grey-blue appearance and were identified as *Pasteurella haemolytica*. [KP]

EXPERIMENTAL USE OF PREDNISOLONE IN BRUCELLOSIS

Lisobey, V. A. The effect of prednisolone on blood serum proteins in antibrucellosis vaccination and in experimental brucellosis. Voprosy meditsinskoy khimii, v. 12, no. 2, 1966, 158-163.

The processes of vaccination and infection affect the protein composition of the blood. Cortisone-type steroid hormones participate in immunogenesis and have been used with varying effectiveness in the treatment of infectious diseases, including brucellosis. In this experiment, guinea pigs were either infected with, or vaccinated against, brucellosis. Oral administration of 5 mg of prednisolone was begun before, at the time of, or after infection or vaccination and was continued for six days. The protein content of the blood plasma was determined refractometrically and the protein fractions were separated by electrophoresis. Blood protein was obtained after vaccination and during the development of the disease. The animals were vaccinated with live brucellosis vaccine, after which agglutinin accumulation was studied, as well as the protein composition of the blood serum. Infection was accomplished by ten doses of virulent bovine brucellosis culture. In vaccinated guinea pigs, albumin quantity decreased, and gamma globulin content

sharply increased, causing a decrease in the albumin-globulin coefficient. Administration of prednisolone reduced albumin and beta globulin content. Maximum increase in gamma globulin content occurred at the end of the first month. The combination of vaccine and prednisolone retarded gamma globulin content increase. Regardless of the time of its administration, prednisolone did not inhibit production of agglutinins in vaccinated animals but did, however, lessen the strength of the immunity. There was no correlation between the agglutinin titer and the quantity of gamma globulin in the plasma. Brucellosis infection was accompanied by increased total protein content with distinct decrease in beta and gamma globulins. Prednisolone, administered before or after infection, normalized gamma globulin content within a month. When animals were infected 30—90 days after vaccination with administration of prednisolone in various combinations, gamma globulin content dropped sharply. An exception was a group of animals infected one month after administration of vaccine and prednisolone.

ASSOCIATION: Odesskiy nauchno-issledovatel'skiy institut epidemiologii i mikrobiologii im. I. I. Mechnikova (Odessa Epidemiological and Microbiological Scientific Research Institute) [EL]

SULFANILIC ACID IN CONTROL OF STRIPE RUST OF WHEAT

Liu, Han-wen, Hsia, Yuan-t'ing, and Ch'ang, Yu-lung. Field experiments in the application of sulfanilic acid for the control of stripe rust of wheat in Shensi province. Chih wu pao hu hsueh pao (Acta phytophylacica sinica), v. 4, no. 4, 1965, 341-346.

The effectiveness of sulfanilic acid in controlling stripe rust of wheat depends upon the method of application. Experimental results from Wu-Rung in Shensi Province in 1964 indicate that by using a synthetic detergent in addition to the fungicides, the effectiveness of the latter is increased up to 5.8 times for small plots and 2.1 times for large field areas in comparison with the fungicide applied alone. Furthermore, the synthetic detergent increases rain resistance.

ASSOCIATION: Shensi Province Plant Protection Institute. [CR]

EXPERIMENTAL INFECTION WITH COXSACKIE A-7 VIRUS

Lutynski, R., and Z. Chlap. *Experimental infection with Coxsackie A-7 virus. II. Course of the infection and morphology of the lesions in different species of rodents.* *Acta Medica Polona*, v. 7, no. 1, 1966, 71-82.

The cause of infection and the patterns of morphologic lesions in hooded rats, hamsters, guinea pigs, and rabbits infected under identical conditions with Coxsackie A-7 virus was studied. Syrian hamsters appeared to be most susceptible to the infection. White mice and hooded rats were less so, and rabbits and guinea pigs were least susceptible. The morphologic patterns of the muscular lesions in infected animals had the character of degenerative-inflammatory lesions, and their intensity and localization depended on the age and species of the rodents. Central nervous system lesions were observed mainly in animals exhibiting higher susceptibility to the infection.

ASSOCIATION: Provincial Sanitary-Epidemiologic Station, Moscow (Director: Prof. Dr. M. Bilek); Department of Pathological Anatomy, Medical Academy, Moscow (Director: Prof. Dr. J. Kowalczykowa) [EL]

ENHANCEMENT OF JAPANESE B ENCEPHALITIS VIRUS TITER

Mao, Chiang-sen, and Huang, Chen-hsiang. *Enhancement of the virus titer of Japanese B encephalitis virus propagated in chick embryo cells by D₂O.* *Wei sheng wu hsueh pao (Acta microbiologica sinica)*, v. 12, no. 1, 1966, 24-28.

Japanese B encephalitis virus when grown in D₂O-treated cells was found to have a higher titer than the control. The difference was found to be greater in the heat-labile Nakayama strain than the more heat-stable Peking strain. The increase in the yields of virus was found to be related to the lower production of interferon and greater

heat stability of the virus when grown in D₂O treated cells. Thus, two factors were found to play a part in the mechanism of D₂O action, namely, an increase in heat stability of the virus and a decrease in interferon production.

ASSOCIATION: Virology Institute, Chinese Academy of Medical Sciences [CR]

OCCURRENCE OF *LEPTOSPIRA ERINACEI EUROPAEI* IN MOGILEV OBLAST

Mezhennyy, A. M. Zhurnal microbiologii, epidemiologii i immunobiologii, no. 3, 1966.

Leptospira erinacei europaei were first isolated from European orchard grass in Moscow oblast in 1951. The agglutination reaction, lysis with leptospira strain yezh-1, was performed on blood samples from 3216 subjects with varying diagnoses of disease, and on samples from healthy subjects in Mogilev oblast. Positive results were obtained in 7.6% of cases. Antibodies to this leptospira type were present six times more often in rural patients than in urban patients. 944 people on animal breeding farms and in a meat packing plant were examined and positive results were obtained in 13.5% and 38.3% of the cases, respectively. In sporadic outbreaks of leptospirosis, caused by *L. erinacei europaei*, and in single outbreaks dependent on specific causes and various species of leptospira, mostly Pomona, infectious sources were farm animals. 13.9% of cattle, 22.6% of pigs, and 47.2% of horses possessed antibodies to *L. erinacei europaei*.

ASSOCIATION: Tsentral'nyy institut usovershenstvovaniya vrachey (Central Institute for the Improvement of Physicians) [LP]

TOXIN SYNERGY

Minervin, S. M., and S. P. Zhak. Effect of *Aspergillus terricola* protease on lethal properties of *Cl. perfringens* type A toxin. *Zhurnal mikrobiologii, epidemiologii i immunobiologii*, no. 1, 1966, 115-117.

Three groups of white mice were injected with *Asp. terricola* protease and *Cl. perfringens* toxin suspensions, protease alone, or toxin alone. *Asp. terricola* protease intensified the lethal action of *Cl. perfringens* toxin when toxin and enzyme were combined just before administration to animals, and when given after toxin and enzyme were incubated 15 to 30 minutes suspended in buffer at pH 5 and pH 7. Longer incubation destroyed the toxin as did a pH higher than 8.5. At pH 7, partial destruction of toxin occurred.

Toxin synergy studies by Levenshtam, Kirilenko, Tselukh, Denets, Dumkina, Savin, Zanchevskaya, and Mitskevich, and investigation of enzyme activation of toxins by Chertkova, Kaplanskiy, Nechayevskaya, Denisova, and Domoradskiy are mentioned. Currently, the potentiation mechanism of bacterial toxin is unclear but the results of this experiment support Minervin's theory that the protease possibly destroys existing toxin but activates protoxin to toxin transformation, increasing the lethal effect of the combination dose as compared to control doses. Foreign authors have demonstrated the existence of a protoxin in *Cl. oedemeticus* toxin. *In vitro* tests were also made, but results were not as conclusive as results of experiments on animals.

ASSOCIATION: Odesskiy meditsinskiy institut im. Pirogova
(Odessa Medical Institute) [LP]

ANTIALLERGENIC FREEZE-DRIED RABIES VACCINE

Mirigmailov, M. I., F. I. Rakhimova, R. P. Sinitsina, and N. N. Sheremet'yev. Experimental production of lyophilized antiallergenic antirabies vaccine. Meditsinskiy zhurnal Uzbekistana, no. 2, 1966, 18-19.

Modern research has conclusively shown the allergic nature of postvaccination paralysis connected with antirabies vaccine. Lyophilized cells fully preserve the basic properties of sera and vaccines and also the viability of bacteria and viruses for months and years. It is also known that animal brain tissues from birth to the sixth day of life are devoid of encephalitic antibodies. Preliminary experimental and practical observations have confirmed theories about the value of freeze-dried brain tissue preparations. The present work involved test preparation of antirabies vaccine from newborn rat brains, including its production technology (that is, studying its inactivation, drying media, drying processes, its physical properties, immunogenicity, and establishing its absence of encephalitic activity). Seven series of rat vaccine were prepared, two liquid and five dry. Of 40 guinea pigs not one died from the new vaccines, as compared to 8 out of 10 controls who showed classic disruption of neural function, showing the superiority of the new vaccines.

ASSOCIATION: Tashkentskiy nauchno-issledovatel'skiy institut vaktsin i syvorotok (Dir.—Kand. Meditsinskikh nauk A. A. Abidov) (Tashkent Vaccine and Sera Research Institute) [LP]

TREATMENT OF MALIGNANT ANTHRAX

Mukhordov, F. G., V. I. Gladkov, and P. D. Musokhranov.
Zhurnal mikrobiologii, epidemiologii i immunobiologii,
no. 3, 1966, 143-145.

In treating 12 patients suffering from malignant anthrax, a complex therapy consisting of treatment with anti-anthrax serum, penicillin, biomyacin, vitamins, and symptomatic agents produced favorable results. All cases improved 24—48 hours from start of treatment. In very severe cases hormone therapy is recommended in addition to the complex therapy.

ASSOCIATION: Kemerovskiy meditsinskiy institut i gorodskaya infektsionnaya bol'nitsa (Kemerovo Medical Institute and Municipal Infectious Disease Hospital) [LP]

SIMULIIDAE OF THE LOWER KAN RIVER

Murav'yeva, T. V. *Simuliidae of the lower Kan River in the Krasnoyarsk region. Meditsinskaya parazitologiya i parazitarnyye bolezni*, no. 1, 1966, 15-19.

In this area 25 species of simuliidae imago and larvae were found. During the entire season, 99.2% of adults consisted of *Simulium galeratum*, *S. morsitans longipalpe*, *Gnus jacuticum* and *Gnus cholodkovski*. The Kan River and the Rybnaya, its largest tributary, are the main breeding places of these bloodsucking black flies. Water temperature is the most important factor determining simuliidae species composition in streams while current speed mainly influences habitat distribution of larvae in the river. *P. alpestre*, *P. tridentatum*, *E. longipalpe*, *E. bicornis*, and *E. shevjakovi* preferred stony bottom areas with a temperature no higher than 10°C. Only one species, *E. aureum*, was collected where current speed was less than 0.5 m/sec.

ASSOCIATION: Otdeleniye biologii i ekologii nasekomykh instituta meditsinskoy parazitologii i tropicheskoy meditsiny im. Ye. I. Maritsinovskogo Ministerstva zdravookhraneniya SSSR, Moskva (Insect Biology and Ecology Section, Institute of Medical Parasitology and Tropical Medicine, Ministry of Health SSSR) [LP]

THE EFFECT OF CERTAIN ANTIBIOTICS ON THE IMMUNITY DEVELOPMENT PROCESS IN BRUCELLOSIS INFECTION

Navasardyan, A. A. Material from a report given at conference of junior research personnel. Yerevan zoological veterinary institute, 1965, 65-72. (TAKEN FROM: Referativnyy zhurnal. Biologiya, no. 2, 1966, 2B532, 80)

A study of the effects of penicillin, streptomycin, chlorotetracycline, oxytetracycline, monomycin, and a combination of monomycin with penicillin on the production of specific antibodies and on certain characteristics of natural resistance of the organism during immunization with dry live brucellosis vaccine from strain 19 revealed the following: Penicillin given simultaneously with the first vaccine injection inhibited the antibody production process, but when given after seven days did not affect the development of specific antibodies. Streptomycin and monomycin suppressed antibody production while oxytetracycline did not. In single-stage immunization of sheep, brucellosis vaccine given simultaneously with penicillin in doses of 10 to 20 thousand units per kilogram daily for 7 days did not decrease antibody production. Streptomycin, in the same doses, and a combination of monomycin with penicillin depressed the agglutinin formation process. Chlorotetracycline, streptomycin, and monomycin also depressed complement-fixation antibody formation.

[LP]

LUMINESCENT MICROSCOPY IN LEPTOSPIROSIS DIAGNOSTICS

Novikova, V. N., and I. V. Purtova. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 3, 1966.

Leptospirosis was diagnosed in suckling rabbits infected with *Leptospira pomona* from a 13 to 15 day culture or from blood of diseased animals. Blood, tissue, and urine slides were prepared for microscopy by coating such slides with luminescent leptospirosis serum or fluorescent serum by standard methods, and were examined using an ML-1 type

microscope with SZS-7, FS-1, and BS-8 light filters, a ZhS-18 ocular filter, and a SVDSH-250-3 lamp as light source. Under these conditions leptospira fluoresced with a clear light green color. To determine specificity of labeled antisera, stock strains of homologous and heterogeneous leptospira were stained with sera. Homologous types fluoresced brightly; *Leptospiridae grippotyphosa*, *erinacei*, and *auriti* fluoresced weakly; and *Leptospiridae bataria*, *canicola*, *tarassovi*, and *kazachstanica* hardly fluoresced at all. Against a weakly fluorescing background of other blood components, leptospira fluoresced brightly in either dark or light fields. None of the unlabeled controls showed this property. Further studies are being made of specificity, sensitivity, and possible early diagnostic use of this method.

ASSOCIATION: Tomskiy meditsinskiy institut (Tomsk Medical Institute) [LP]

AN ASSAY FOR *BRUCELLA* DIFFERENTIATION

Ostrovskaya, N. N., and Ye. I. Kaytmazova. Assay with tb bacteriophage as a supplementary test for differentiating Brucella species. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 3, 1966, 75-79.

Three hundred twenty-one *Br. Abortus*, 298 *Br. melitensis*, and 62 *Br. suis* cultures isolated from man, cattle, sheep, and swine from various parts of the Soviet Union were preliminarily typed by standard methods and then typed by the tb test using *Brucella* bacteriophage tb-3 in two recommended concentrations. Selective sensitivity of *Br. Abortus* cultures was shown when complete lysis occurred with both recommended phage concentrations in 96.6% of test cases. The majority of *Br. Melitensis* and *Br. Suis* cultures were resistant to tb-3 phage.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei AMN SSSR, Mskva (Institute of Epidemiology and Microbiology, AMN SSSR) [LP]

EXPERIMENTAL TREATMENT OF PHYTOPATHOGENIC BACTERIA

Pavlovicha, D. Ya. Effect of certain microorganisms and preparations on phytopathogenic bacteria. IN: Akademiya nauk Latvyskoy SSR. Institut mikrobiologii. Mikroorganizmy i rasteniya (Microorganisms and plants). Riga, 1963, 119-124. (ITS: Trudy, no. 18, 1963).

Nitrofurans, *in vitro* mycological antagonists, and antibiotics isolated from microorganisms were tested for their effect on phytopathogenic bacteria. Bacteria were grown on antagonist-containing potato agar and in test tubes of meat-peptone broth containing serial dilutions of microcide, polymixin, phyto bacteriomyacin, furazidin F₃₅ and furazolidon F₆₀ preparations. Effects of antagonistic actinomycetes on phytopathogenic bacteria which cause certain crop diseases are shown. *Ps. medicaginis* var. *phaeseolicola* and *erw. phytophthora* were most sensitive, and *Ps. pisi* and *Ps. syringae* least sensitive, to the action of microorganisms. Cultures of *Act. globisporus*, *lavendulae*, and *violacens* reduced phytopathogenic bacterial development. Penicillium fungi are more effective for this than *Geotrichum* sp. no. 652. All microbial preparations tested limited bacterial growth. Especially interesting to the authors was the inhibitory action of nitrofurans on the growth of *Ps. lachrymans* and other phytopathogenic bacteria. [LP]

GROWTH AND TOXIN FORMATION BY *CL. PERFRINGENS* STRAINS IN FOOD PRODUCTS

Pivovarov, Yu. P. *Gigiyena i sanitariya*, no. 2, 1966, 96-97.

One hundred ml suspensions of meat and milk product samples were infected by adding measured quantities of microbial suspensions of one of 12 *Cl. perfringens* strains and incubated at 30—32°C, 18—20°C or 4°C for 4, 8, 24, and 48 hr. Aliquots from each sample were injected into white mice to test for toxicity and pure *Cl. perfringens* cultures were obtained from each sample for studying culture,

morphological toxicity, stability, and biochemical properties of each strain. Large concentrations of *Cl. perfringens* were observed in raw meat and milk samples incubated at 30—32° in 4—8 hours. Growth of *Cl. perfringens* was hindered by the growth of saprophytic microorganisms in the product. In products infected after heating, intensive growth and toxin formation was made possible by the reduction of the numbers of competing microorganisms. In canned goods pH and the nature of the product determined the amount of growth and toxin formation.

ASSOCIATION: Kafedra obshchey gigiyeny II Moskovskogo meditsinskogo instituta im. N. I. Pirogov (Department of General Hygiene of the Second Moscow Medical Institute)
[LP]

MOSQUITO ECOLOGY IN THE TOMSK REGION

Polyakova, P. Ye., and A. G. Mirzayeva. Meditsinskaya parazitologiya i parazitarnyye bolezni, no. 1, 1966, 35-38.

In 1960, 7624 female mosquitoes from the Asino district of the Tomsk region were captured and examined, and 14 species were found, dominated by *Aedes punctor*, *Ae. communis* and *Ae. cirereus*. Phenology and percentage ratios of individual species, and effects of temperature and light on flight activity were studied in order to plan mosquito control in Western Siberia.

ASSOCIATION: Laboratoriya parazitologii Biologicheskogo instituta SO AN SSSR, Novosibirsk (Parasitology Laboratory, Biological Institute, SO AN SSSR)
[LP]

DIPTERA IN THE ANGARA RIVER DISTRICT

Rasnitsin, S. P., S. I. Makarova, and G. A. Sheveleva.
*Distribution of Diptera, Simuliidae in streams of the
Angara River District. Meditsinskaya parazitologiya i
parazitarnyye bolezni, no. 1, 1966, 3-5.*

In streams of the Angara River District water temperature is the main influence on the distribution of blackfly larvae. Where the water temperature is 3—10°C *Prosimulium alpestre* predominate; from 11—16°, *Simulium vulgare*; at 21° and above, *Eusimulium aureum*, *E. Latipes* and *Hellichia baffinensis*. *P. alpestre*, *S. vulgare*, and *Cnephia edwardsiana* are most numerous. In streams, bloodsucking species seldom occur both in the larval and imago stages and have little practical importance.

ASSOCIATION: Otdeleniye biologii i ekologii nasekomykh Entomologicheskogo otdela Instituta meditsinskoy parazitologii i tropicheskoy meditsiny im. Ye. I. Martsinovskogo Ministerstvo zdravookhraneniya SSSR, Moskva (Insect Biology and Ecology Section, Entomology Department, Institute of Medical Parasitology and Tropical Medicine, Ministry of Health SSSR) [LP]

INTERACTION OF TICK-BORNE ENCEPHALITIS WITH DIPLOID CELLS

Semenov, B. F., P. S. Karaseva, and R. I. Rapoport.
Voprosi virusologii, no. 1, 1966, 17-21.

Experiments show possibilities for preparing activated vaccine from virus grown in diploid cells. Six old and six newly isolated tick-borne encephalitis virus strains grew readily in diploid cells with no cytopathologic effect. Size of infecting dose did not influence virus accumulation level in culture fluid during the stationary phase. After long passage through diploid cells, the "Pan" strain acquired the ability to destroy such cells. Its cytopathic activity in swine embryo kidney epithelial

cells increased 10- to 100-fold, and pathogenicity for intracerebrally or peripherally inoculated mice was reduced.

ASSOCIATION: Moskovskiy nauchno-issledovatel'skiy institut virusnykh preparatov (Moscow Scientific Research Institute of Virus Preparations) [LP]

CL. TETANI SOIL CONTAMINATION IN THE KAZAKH SSR

Sergeyeva, T. I., K. I. Matveyev, and M. B. Kabirova. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 3, 1966, 103-106.

In a Kazakh tetanus study, 16% of 508 soil samples examined were contaminated by *Cl. Tetani*. Tables of soil study results obtained at different stations in Alma-Ata oblast of the Kazakh SSR show *Cl. Tetani* distribution in different soil types and zonal and seasonal distribution of tetanus incidence in the Kazakh SSR, a marked increase being noted in summer. This information should be considered in planning and achieving mass antitetanus measures.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamelei AMN SSSR (Institute of Epidemiology and Microbiology AMN SSSR) [LP]

STANDARDIZATION OF *PERFRINGENS* TOXINS AND TOXOIDS IN TISSUE CULTURE

Shamrayeva, S. A., Z. M. Volkova, and V. S. Samsonova. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 1, 1966, 138-141.

A cytotoxic effect on chick fibroblast tissue culture cells was observed only in the presence of active *Cl. perfringens* toxin from filtrates grown on pancreatic or *Asp. terricola* casein hydrolysate-based media and not after neutralization or destruction of toxin. Titrating *perfringens* toxin in chick embryo tissue culture was more sensitive and accurate than titration in white mouse cells, making the former method more useful in determining toxin and toxoid activity. Results varied with type and age of tissue culture, and most sensitivity was shown by 1--3-day-old cultures of 11 day chick embryo cells (Table 1).

Table 1. Sensitivity of various kinds of tissue culture to action of toxin

Cytotoxic changes in various tissue cultures													
Dose in Dlm/ml	Primarily trypsi- nized		Tissue strains										
	Chick embryos	Monkey kidney	Nyer-2	Human amnion-F	Human amnion-1	PKB	KEM-1	PEK	Detroit-6	KV	L	Changes	S-18
250	++	+	+	+	+	+	+	+	+	+	+	+	+
25	++	++	++	++	++	++	++	++	++	++	++	++	++
2.5	++	++	++	++	++	++	++	++	++	++	++	++	++
0.25	++	++	++	++	++	++	++	++	++	++	++	++	++
0.025	++	++	++	++	++	++	++	++	++	++	++	++	++

Key: + Distinct cytotoxic changes; - unchanged tissue

ASSOCIATION: Institut epidemiologii i mikrobiologii im.
Gamalei AMN SSSR (Institute of Epidemiology and Micro-
biology, AMN SSSR) [LP]

BLOODSUCKING DIPTERA IN THE CHERNIZOV REGION OF THE UKRAINE

Shevchenko, A. K. Meditsinskaya parazitologiya i parazitarnyye bolezni, no. 1, 1966, 28-32.

Forty-nine Dipteran species falling into three families were found in the middle part of the Resna River in the Chernizov region. Species composition, breeding places, and seasonal prevalence were studied. Anopheles breeds near the shores of the Seyma and Ubed Rivers. The greatest numbers were found in the Ubed delta. In spring *Sch. matthiesseni* are found principally near the Desna and Seyma. Culicidae were found in greatest numbers in the middle of June in quiet waters and in cisterns. Many Aedes species inhabit peat bogs and swamps. In spring *Aedes behningi* and *Ae. intrudens* were prevalent; in early summer, *Ae. excrucians*—in damper places *Ae. maculatus* and *Ae. flavescens*; in July, *Ae. dianteus* and *Ae. cinereus*; and in August, *Ae. vexans*. The land and climate conditions of this area are favorable to this type of insect.

ASSOCIATION: Nauchno-issledovatel'skiy institut biologii Khar'kovskogo gosudarstvennogo universiteta im. Gorkogo (Biological Research Institute, Kharkov State University)
[LP]

NEW AVIAN PARASITE SPECIES

Shluger, Ye. G., and G. S. Bel'skaya. New species of red-bodied ticks (Acariformes, Trombiculidae) on birds in Turkmeniya. IN: Akademiya Nauk Turkmeniskoy SSR. Izvestiya, no. 1, 1966, 64-70.

In a bird study in the Badkhyz, Kopet-Dag, Kyuren-Dag, Kopet-Dag foothills, and Malye Balkhana regions of Turkmenia carried out in 1962-1963, 8 new Trombiculid species were observed. The species are: *Neoshongastia invisitata*, *N. inopinata*, *N. turbida*, *N. gracilis*, *N. dissimilis*, *N. longitarsalis*, *Trombicula angulata*, and *T. asiatica*. *N. invisitata* larvae parasitize the Indian pied wheatear, the pied wheatear, *Oenanthe isabellina*, *Oenanthe hispanica*, the small owl, rock sparrow, bee eater, winechat, and

hoopoe. *N. inopinata* infests *Oenanthe isabellina*, *Oenanthe hispanica*, pied wheatears, winechat rollers, small owls, and rock sparrows. *N. Turbida* infests rollers and various wheatear species. *N. gracilis* infests the Indian pied wheatear, the pied wheatear, and other wheatears. *N. dissimilis* larvae parasitize rollers and wheatear species listed above. *N. longitarsalis* larvae parasitize rollers, wheatears, and the rock sparrow. *Trombicula angulata* has rollers, wheatears, small owls, and bee eaters as hosts. *T. asiatica* is a wheatear parasite.

ASSOCIATION: Institut epidemiologii i mikrobiologii AMN SSSR; Institut zoologii i parazitologii AN Turkmenskoy SSR (Institute of Epidemiology and Microbiology, Academy of Medical Sciences; Institute of Zoology and Parasitology, Academy of Sciences Turkmen SSR) [LP]

CRYSTAL-FORMING BACILLI

Shvetsova, O. *Zashchita rasteniy*, no. 3, 1966, 43-44.

Preparations from *Bacillus thuringiensis* cultures have been used in pest control. These bacilli form rhomboidal protein inclusions toxic to insects, and therefore it is planned to perfect the manufacture of such preparations and increase their use. The first inclusions were isolated from Mediterranean flour moths and silk worms. They can also be separated from sick and healthy species of: Lepidoptera, Hymenoptera, Hemiptera, Homoptera, sawflies, Hottentot bugs, San Jose scale, cicadas, beetles, bees, etc. Crystals formed by the various species are distinguished by form, size, structure, and composition. These characteristics are connected with the specific effect of crystals on insects. The variable effects also depend on the insect species. In one species of insect a given bacillus type will produce septicemia, in another, intoxication. New data on the action of variant cultures on insects show a greater understanding of the crystal production process, so that by close study of the physiology of a particular insect species the most virulent strain

for that species may be selected and the effectiveness of existing preparations may be increased. The author and others participated in manufacturing and testing a compound preparation including crystal-forming bacilli with various properties which was more successful than entobacteria for reducing beetle population, and they expect to isolate and test many new strains of bacilli in the near future.

ASSOCIATION: Institut sel'skokhozyaystvennoy mikrobiologii, Leningrad (Institute of Agricultural Microbiology)
[LP]

EXPERIMENTAL ENCEPHALOMYELITIS

Sokolov, A. V. Experimental encephalomyelitis induced by neurocytotoxins from antirabies gamma globulin. Fiziologichniyi zhurnal, v. 12, no. 2, 1966, 238-245.

Complement fixation and passive anaphylaxis methods showed that antirabies gamma globulin contains antigens organo-specific to neural tissues of rabbits, guinea pigs, and man, and that it sensitizes animal nervous tissue to neurovirus vaccines. Clinical and histological examination showed that after six or seven daily intramuscular injections of such gamma globulins, specific action of neurocytotoxins on neural tissue produced changes characteristic of encephalomyelitis in guinea pigs and rabbits.

ASSOCIATION: Viddil fiziologiyi i patologiyi shkiry Kiyivs'kogo instytutu tuberkul'ozu i grudnoyi khirurgiyi (Department of Skin Physiology and Pathology, Kiev Institute for Tuberculosis and Thoracic Surgery)
[LP]

NEW TREATMENT FOR NEMATODES

Spasskiy, A. A. Priroda, no. 2, 1966, 116-117.

A paper presented by S. G. Myure at the fourth All-Union Conference on immunity in agricultural plants gave plans for using a combined chemical and biological method to kill nematodes without harming beneficial soil organisms. The method works by producing changes in the biochemistry of the diseased plant. Common methods used to destroy nematodes usually kill useful organisms, while nematodes avoid most poisons by moving to deeper, unaffected areas of the soil. Physiologically active substances, however, affect nematodes selectively and do not harm other organisms.

ASSOCIATION: Akademiya nauk Moldavskoy SSR (Academy of Sciences, Moldavian SSR) [LP]

BRUCELLOSIS IN KASHKA-DAR'YA OBLAST

Sukharensko, S. N. Bacteriological characteristics of brucellosis in Kashka-dar'ya oblast. Meditsinskiy zhurnal Uzbekistana, no. 1, 1966, 48-53.

Brucella Melitensis and *Br. abortus* strains were isolated from humans and cows in Kashka-dar'ya oblast. *Br. Melitensis* strains were identified as first, second, or third biotypes and *Br. abortus* as third, fourth, or sixth. Forty-nine percent of *Br. Melitensis* hemocultures were atypical in that they displayed H_2S -forming activity. Common strains separated from humans and cattle were *Br. Melitensis* biotype one and *Br. Abortus* biotypes three and six. Positive *Brucella* hemocultures were obtained in 6.4% of cases from patients with negative Raitt and Huddleson reactions. This confirms the conclusion that there is a wide range of bacterial behavior in patients regardless of serological reaction.

ASSOCIATION: Kafedra Mikrobiologii Tashkentskogo meditsinskogo instituta, otdela po izucheniya brutselleza Instituta Krayevoy patologii AMN SSSR i sanepidstantsii (Glavvrach—N. I. Shishkov) Kashkadar'inskoy oblasti (nauchnyye rokovoditeli—Prof. P. F. Samsonov, doktor biologicheskikh nauk M. M. Rementsova i dots. Yu. A. Akhmedzhanov) (Department of Microbiology, Tashkent Medical Institute, Section on Brucellosis Studies, Institute of Emergency Pathology, Academy of Medical Sciences SSSR and Health Station of Kashka-dar'ya) [LP]

BIRD POPULATIONS IN TURKMENIA

Sukhinin, A. N., G. S. Bel'skaya, and A. O. Tashliyev. Characteristics of the bird population of certain regions of western Kopet-Dago. Communication 2. IN: Akademiya nauk TurkmSSR. Izvestiya, no. 1, 1966, 71-75.

A bird census was conducted in the spring of 1962 in a juniper zone of the upper Arbaz River valley and in lower waterless ravines in Ipay-Kala and Yel-Dere. Brambles and other underbrush in the valley provide good cover. In 44 field hours in the valley 1333 birds were counted; in the ravines 659 in 40 hours; and in the Yel-Dere ravine 263 birds in 16 hours, for a total of 2255 birds. In the juniper zone, 43 species were counted and are listed in descending order of prevalence in Table 1.

Table 1 Occurrence of bird species
listed in descending order of frequency

a - In Juniper stands and the Arvaz River
valley (Ipay-Kala)

Species

Red topped finch
Black redstart
Crag martin
Rock bunting
Stonechat
Indian pied wheatear
Lesser whitethroat

Table 1. (Cont.)

Common whitethroat
Coal tit
Lesser lark
(*Scotocerca inquieta*) Warbler
Wood lark
Orphean warbler
Alectoris kakelik
Wheatear
(*Oenanthe hispanica*) Ring dove
Skylark
Rock sparrow
Warbler
Lark sp.
Cuckoo
Linnet
Blue rock thrush
Magpie
Red-breasted flycatcher
Chough
Bearded vulture
Falcon
Hoopoe
Bee eater
Chaffinch
Black headed bunting
Goldfinch
Tawny pipit
Great tit
Rock thrush
Turtledove
Corn bunting
Roiler
Short-toed eagle
Hooded crow
Crested lark
Rock nuthatch

b - In the Arvaz River valley only (Ipay-Kala)

Species

Rose-colored starling
Swift
Reed warbler
Sand martin
House sparrow

Table 1. (Cont.)

Red-backed shrike
 Longtailed tit
 Spotted flycatcher
 Nightingale
 Isabelline wheatear
Cettia cetti
 Green willow wren
 Tree sparrow
 Blackbird
 Rock dove
 Blue tit
 Green sandpiper
 Common wren
 Mistle thrush
 Black kite
 Golden oriole
 Lesser grey shrike
 Little owl
 (*Accipiter badius*) Falcon
 Vulture
 Griffon vulture
 Olivaceous warbler

The red-topped finch is the dominant species. I. P. Dement'yev divides the birds of Turkmenia into five basic categories: a) a basic nucleus of desert dwellers; 2) a basic nucleus of rock dwellers; 3) typical species of birds in cultivated oases; 4) birds of Tugaic River valleys; 5) water birds. Of the 43 species listed in Table 1, 28 are rock dwellers, 8 inhabit oases, 1 inhabits river valleys, and 6 inhabit desert areas. There are 63 bird species in the Ipay-Kala area. The rose-colored starling is the dominant species. Of these species 34 are rock dwellers, 18 live in oases, 6 are desert dwellers, 3 are lake dwellers, and 1 is a tugaic species (the turtle dove). Of 36 species recorded in the Yel-Dere ravine, 23 were rock dwellers, 11 oasis types, 1 water-dwelling species, and 1 tugaic species. No desert types were observed. All the species recorded there in a 16 hour period are listed in Table 2. Eighteen species were observed in all three habitats studied. Rock-dwelling species composed 80.9% of the birds inhabiting juniper stands. In the Arvaz River valley and the Yel-Dere ravine, the percentages were 39% and 70.7%, respectively. Oasis dwellers made up 11.5% of birds in juniper areas, 46.9% of Arvaz valley birds, and 23.2% of Yel-Dere species. Water birds composed 4.3% of the Arvaz valley birds, and 2.3% of the Yel-Dere population. The average number of birds

observed per hour was 16.47 in the juniper zone, 25.75 in the Arvaz River valley, and 16.43 in the Yel-Dere ravine.

Table 2. Occurrence of bird species of the Yel-Dere ravine listed in descending order of frequency

Species

Blackbird
Nightingale
Common whitethroat
Rock sparrow
(*Alectoris kakelik*)
Sand martin
Crag martin
Rock bunting
Black headed bunting
Great tit
Orphean warbler
Turtledove
Ring dove
Chaffinch
House sparrow
Goldfinch
Reed warbler
Magpie
Black kite
Cuckoo
Spotted flycatcher
Swift
Warbler
Lesser whitethroat
Wren
Grey wagtail
Pheasant
Linnet
Grosbeak
Rock dove
Kestrel
(*Accipiter badius*) Falcon
Rock thrush
Bee eater
Roller
Hoopoe

ASSOCIATION: Institut zoologii i parazitologii AN Turk-
menskoy SSR (Institute of Zoology and Parasitology,
Turkmen Academy of Sciences) [LP]

TICK-BORNE RICKETTSIOSIS AND TSUTSUGAMUSHI FEVER

Tarasevich, I. V., and G. P. Somov. Comparative serological study of tick-borne north Asian rickettsiosis and tsutsugamushi fever. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 1, 1966, 83-87.

Standard strains of *D. sibiricus* (strains 7 and 8), *bogdanovi*, and *gilliam* (*R. tsutsugamushi*) were studied. Gilliam antigenic structure was closer to that of *R. tsutsugamushi* strains isolated from red rodent ticks in the Primore and northern Japan. Antigens prepared from the above strains, a commercial antigen prepared by the Epidemiology Institute imeni Gamalei AMN SSSR, a soluble antigen from Gilliam strain, and specific immune sera were used in comparative serological examination of the prepared antigens, using the complement-fixation reaction with specific rickettsiosis antigens recommended for differential diagnosis of tick-borne rickettsiosis and tsutsugamushi fever (Table 1). There was no antigenic affinity between the strains although both induced antibody production against proteus OX_k.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei AMN SSSR (Institute of Microbiology and Epidemiology AMN SSSR)

Table 1. Results of the complement fixation reaction with varying dilutions of various sera

Antigen	Dilution	Rabbit serum against Gilliam strain						Complex serum from the Institute of Epidemiology and Microbiology imeni Gomeley against Netsvetayev strain					
		1:10	1:20	1:40	1:80	1:160	1:320	1:640	1:1280	1:2560	1:5120	1:10240	1:20480
Soluble antigen from Gilliam strain	1	++	++	++	++	++	++	++	++	++	++	++	++
	2	++	++	++	++	++	++	++	++	++	++	++	++
	4	++	++	++	++	++	++	++	++	++	++	++	++
	8	++	++	++	++	++	++	++	++	++	++	++	++
	16	++	++	++	++	++	++	++	++	++	++	++	++
Netsvetayev strain-whole	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0	0	0	0	0
Bogdanov strain-whole	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0	0	0	0	0
Bayabash-levada strain-whole	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0	0	0	0	0
Same particulate	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0	0	0	0
	16	0	0	0	0	0	0	0	0	0	0	0	0

Key: +++, ++, + varying degrees of complement fixation, ± doubtful results of the reaction, 0 no fixation

Table 1. (Cont.)

Antigen	Di- lution	Guinea pig serum against Bogdanov strain						Rabbit serum against Barabash- Levada strain					
		1:10	1:20	1:40	1:80	1:160	1:320	1:10	1:20	1:40	1:80	1:160	1:320
Gilliam strain- soluble	1:2	0	0	0	0	0	0	0	0	0	0	0	0
	1:4	0	0	0	0	0	0	0	0	0	0	0	0
	1:8	0	0	0	0	0	0	0	0	0	0	0	0
	1:16	0	0	0	0	0	0	0	0	0	0	0	0
	1:32	0	0	0	0	0	0	0	0	0	0	0	0
Netsvetayev strain-whole	1:2	0	0	0	0	0	0	0	0	0	0	0	0
	1:4	0	0	0	0	0	0	0	0	0	0	0	0
	1:8	0	0	0	0	0	0	0	0	0	0	0	0
	1:16	0	0	0	0	0	0	0	0	0	0	0	0
	1:32	0	0	0	0	0	0	0	0	0	0	0	0
Bogdanov strain whole	1:2	0	0	0	0	0	0	0	0	0	0	0	0
	1:4	0	0	0	0	0	0	0	0	0	0	0	0
	1:8	0	0	0	0	0	0	0	0	0	0	0	0
	1:16	0	0	0	0	0	0	0	0	0	0	0	0
	1:32	0	0	0	0	0	0	0	0	0	0	0	0
Barabash-levada strain-whole	1:2	not studied						not studied					
	1:4	not studied						not studied					
	1:8	not studied						not studied					
	1:16	not studied						not studied					
	1:32	not studied						not studied					
Same partic- ulate	1:2	not studied						not studied					
	1:4	not studied						not studied					
	1:8	not studied						not studied					
	1:16	not studied						not studied					
	1:32	not studied						not studied					

Key: +++, ++, + varying degrees of complement fixation,
 + doubtful results of the reaction, 0 no fixation

[LP]

CREATING MIXED INFECTION USING AN AEROSOL OF ORNITHOSIS AND INFLUENZA VIRUS

Terskikh, I. I., and A. I. Gromyko. Voprosy virusologii, no. 1, 1966, 80-84.

White mice in a 220 l capacity IVK-2 chamber were exposed by aerosol to subinfective doses of strain PR-8 type A influenza virus and ornithosis (psittacosis Lori) virus administered simultaneously or with the influenza virus given 48 hours after the ornithosis virus. Exposure to both viruses produced a more severe infection more rapidly with higher ornithosis virus accumulation than exposure to ornithosis virus alone.

The role of influenza virus in intensifying the pathological process of infection by ornithosis virus is unclear. However, histological investigations indicate that the influenza virus may damage the cell in the first stages of the disease, since it has a higher reproduction rate in sensitive cells than ornithosis virus and may prepare the cell for subsequent invasion by ornithosis virus, as any tissue damage in the first 18 hours after infection is caused by influenza virus. Tissue culture and immunoelectrophoretic studies are planned to clarify the mechanism of this intensified developmental and pathological synergistic process.

ASSOCIATION: Institut virusologii im. D. I. Ivanovskogo AMN SSSR, Moscow (Institute of Virusology AMN SSSR) [LP]

VIRUS INTERFERENCE IN PRODUCTION OF LOCAL LESIONS

T'ien, Po, Ping-i T'an, and Ch'uan-kuang Lin. Studies on the interference of potato X virus and tobacco mosaic virus with potato Y virus in the production of local lesions on Physalis floridana. Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 12, no. 1, 1966, 86-90.

In mixed inoculations, PXV and TMV, either in crude tobacco extract or under purified conditions, were almost equally effective in the inhibition of local lesions on *Physalis floridana* caused by PYV.

PXV interfered with PYV only when both viruses were inoculated simultaneously on the same leaf surface. With TMV,

however, interference also occurred with PYV following TMV for unlimited lengths of time or TMV following PYV within 24 hours, and of the two viruses separately inoculated on the upper and lower surfaces of leaves.

The degree of interference by PXV was directly proportional to its concentration in the mixed inoculum. Inactivation of PXV by ultraviolet light irradiation or heat treatment of the virus-containing tobacco extract eliminated its interfering effect. Inhibition of PYV infection by PXV in a mixed inoculum did not occur on plants previously systemically infected with PXV. This relation appeared to hold both with the mild and the severe strain of the X virus used.

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ASSOCIATION: Microbiology Institute, Chinese Academy of Sciences [R]

ORNITHOSIS IN WESTERN UKRAINE

Titov, M. B., and A. S. Lutsuk. Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 3, 1966, 154.

When tested with ornithosis antigen, 38 of 281 persons reacted positively. Twenty-eight positive reactions occurred in a group of 247 patients ill with varying diagnoses of disease, and 10 were from a group of 34 healthy subjects. Among the sick, eight persons with positive ornithosis tests had been hospitalized for pneumonia and five for acute upper respiratory diseases with similar symptoms. Among women, a positive reaction to ornithosis antigen was six times as frequent (25.4%) as among men (4.4%). It was found that women encountered infected birds more frequently in the course of their work. Agricultural workers had positive test results twice as often as city dwellers and the highest number of positive reactions recorded was among people working

in the chicken-processing department of a meat-packing plant.

ASSOCIATION: L'vovskiy meditsinskiy institut (Lvov Medical Institute) [LP]

EPIDERMAL VIRAL INCLUSIONS IN BEANS

Tolmacheva, Ye. A. Peculiarities of the formation of virus inclusions in the epidermis of legumes in pea viral mosaic infection. IN: Akademii nauk BSSR. Doklady, v. 10, no. 3, 1966, 202-205.

The purpose of this study of *Pisum virus-2* Smith. was to investigate regularities of formation and localization of inclusions, their change in the course of disease, and their vegetative growth in order to use such data in rapid diagnosis of disease. *Vicia faba* L. plants were infected by applying a *Pisum virus-2* extract isolated from clover to the leaves. Inclusions were observed in upper, middle, and lower leaves above and not below the inoculation through the summer until the natural death of the plant. Examination of epidermal plant cells shows the presence of granules, cytoplasmic disturbance, thickening, etc. Ten to fifteen days from appearance of the symptoms, clear crystalline, colorless plates about 0.5 to 4.0 microns in size, square or rhomboid shaped, appear. Sometimes they are of indeterminate form. It is easier to observe these x-bodies in the epidermis of pea stems.

ASSOCIATION: Otdel fiziologii i sistematiki nizshikh rasteniy AN BSSR (Department of Physiology and Systematics of Lower Plants AN BSSR) [LP]

MORPHOGENESIS OF EXPERIMENTAL ORNITHOSIS INFECTION

Tolybekov, A. S., and P. I. Krasnik. Voprosi virusologii, no. 1, 1966, 84-90.

In mice inoculated intravenously with ornithosis virus, the virus multiplies principally in elements of the reticulo-endothelial system (macrophages) and in liver cells. When virus accumulates in these cells, a proportion of it is destroyed, accompanied by a local leucocytic reaction and phagocytosis by leucocytes of the viral particles from the lysed cells, showing the protective role played by leucocytes in ornithosis. Results show that granular leucocytes and macrophages play different roles in the pathogenesis of ornithosis infection.

ASSOCIATION: Laboratoriya infektsionnoy patologii otdela patologicheskoy anatomii Instituta eksperimental'noy meditsiny AMN SSSR (Laboratory of Infectious Pathology, Department of Pathological Anatomy, Institute of Experimental Medicine, AMN SSSR); Otdel osobo opasnykh infektsiy Leningradskogo nauchno-issledovatel'skogo instituta epidemiologii i mikrobiologii im. Pastera (Department of Highly Contagious Infections, Leningrad Scientific Research Institute for Epidemiology and Microbiology) [LP]

SCREENING OF INSECT CHEMOSTERILANTS

Ts'ao, Tse-p'u, and Tsung-ping Chang. Studies on insect chemosterilants. IV. Further results on screening of insect chemosterilants. K'un ch'ung hsueh pao (Acta entomologica sinica), v. 15, no. 1, 1966, 13-27.

One hundred two chemicals, mostly newly synthesized, were tested as insect chemosterilants on the housefly and using the same techniques reported in a previous paper (Chang et al., 1963). The results showed: 1) of substituted purines and pyrimidines, 5-Fu and 5-fluoro-orotic acid are both very effective chemosterilants, 1% (w/v in milk powder) fed for 24 hours inducing complete sterility, but only in

females. 2) Pyrimethamine and related compounds were not active as insect chemosterilants, although they are well-known folic acid antagonists as aminopterin. The number of eggs laid was slightly decreased, but there was no effect on the percentage of emergence. 3) Quinoline compounds were for the most part ineffective. 4) A few carbamates showed high toxicity and knockdown effect, but they were also ineffective as sterilants. 5) Several new mustard compounds tested were also ineffective, except one which has two ethylene-imino groups. Unfortunately this compound was partially degraded, so its effect requires reinvestigation in further tests. 6) While hydroxyurea was reported as an effective anti-cancer agent, N-methyl hydroxyurea retarded egg laying for only one day, reducing the number of eggs laid to 40% of normal when fed for 96 hours at 1% concentration. 7) Bis (p-chlorophenyl) trifluoromethyl carbinol was ineffective as chemosterilant either by feeding, contact or topical application, a result in contradiction to Ascher's original observation. 8) Colchicine was an effective chemosterilant when fed in minute amounts (0.01% w/w in milk powder) for long duration. However, high concentrations (0.5%) did not result in complete sterility (about 80%), whereas still higher concentrations (1.0%) caused complete mortality.

The relationship between anti-cancer activity and sterilizing action was discussed briefly.

ASSOCIATION: Biology Department, Peking University [CR]

EXPERIMENTAL ANTIBIOTIC TREATMENT FOR TULAREMIA

Tsvetkova, Ye. M. The dynamic. of bacteriological processes in treatment of experimentally induced tularemia with kanamycin, chlortetracycline, and streptomycin. Antibiotiki, no. 3, 1966, 253-257.

Guinea pigs were inoculated subcutaneously with 100 Dclm of a virulent strain of *Francisella tularensis*. Treatment was begun after clinical manifestation of the disease. The single subcutaneous doses were 10,000 units of kanamycin, 15,000 units of streptomycin, and 10 mg of chlortetracycline.

The first two drugs were administered twice a day for 10 days and the third once every two days, owing to its toxicity for guinea pigs. At the end of the course of treatment tularemia bacteria were not generally detected in the organs tested (the regional lymph nodes and the spleen), but in some cases relapses, accompanied by increased temperature and organic bacteria count, were observed following withdrawal of medication. The best results were obtained with kanamycin and streptomycin. Treatment with chlortetracycline was less effective, possibly because doses which would be nontoxic for guinea pigs would also be insufficient for tularemia treatment.

ASSOCIATION: Laboratoriya tulyaremii (zav. -chlen-korr. AMN SSSR Prof. N. G. Olsuf'yev) Institut epidemiologii i mikrobiologii im. N. F. Gamalei AMN SSSR, Moskva (Tularemia Laboratory, Institute of Epidemiology and Microbiology AMN SSSR) [EL]

SUCCESSFUL TRANSPLANTATION OF *SALVIA OFFICINALIS*

Tucakov, J. Data from a pharmacological study of Salvia officinalis. Glas, no. 18, 1965, 36-38.

Salvia officinalis was planted and now grows with local aromatic plants at Kalaverska Strana in the Svrljig mountains of eastern Serbia. It was studied as a possible substitute for dalmatian-grown sage as a spice, for local land reclamation, as a medicine, and for its essential oils. The organoleptic properties and physico-chemical constants of its oils meet international standards established for dalmatian sage.

ASSOCIATION: Institut de Pharmacognosie de la Faculté de Pharmacie de Beograd et l'Institut de recherches des plantes médicinales (Institute of Pharmacology, Beograd Faculty of Pharmacy, and Medicinal Plant Research Institute) [LP]

ROLE OF CELLULAR COMPONENTS IN SENDAI VIRUS SYNTHESIS

Ugoleva, N. A., S. R. Beakina, and A. D. Nosacheva.
Voprosy virusologii, no. 1, 1966, 31-34.

Chorioallantoic membranes of 10—11 day chick embryos were infected with strain LM-1 Sendai virus, incubated with uninfected controls for 48 hr at 37°C, and cell fractions were separated and studied by standard methods. Hemagglutination tests showed that viral protein synthesis is connected with the cytoplasmic mitochondrial, and especially with the microsomal, fractions, and probably occurs in these structures rather than in the nucleus, where hemagglutinin was barely detectable both before and after destruction of the nuclei. After destruction of cell fractions, hemagglutinin in mitochondria and microsomes increased. Various cell fractionation methods did not alter results greatly, 90% of the virus appearing in the cytoplasm. However, the possibility of viral protein being synthesized in the nucleus and then moving to the cytoplasm was not excluded. Closer studies of synthetic pathways are planned.

ASSOCIATION: Institut virusologii im. D. I. Ivanovskogo AMN SSSR, Moscow (Institute of Virusology AMN SSSR)
[LP]

TROMBICULID LARVAE IN THE KRASNOYARSK REGION

Vasilyeva, I. S. Species distribution and ecology of trombiculid larvae in the Krasnoyarsk region. *Meditinskaya parazitologiya i parazitarnyye bolezni*, no. 1, 1966, 60-69.

From 14642 animals of 25 species about 20,000 trombiculid larvae of 4 species (*Neotrombicula nagayoi*, *N. talmiensis*, *Laurentella latysheva* and *Digenualea* sp.) were collected near Bolshoy Kemchug in the Kozulskiy district of the Krasnoyarsk region. Collections were made May-August, 1959-1961. Most prevalent were *N. nagayoi* (76.2% of collections) and *N. talmiensis* (15.3% of collections). Most common from the middle of July to the middle of August, *N. nagayoi* inhabited birch and aspen forests in dry valleys, and had a wide host range, mainly gray and red voles. Shrews showed less tick infestation than rodents. *N. talmiensis* had similar habitat and seasonal distribution, but was more common in deciduous and mixed forests in hilly areas and infested water voles and field mice, the greatest number feeding on red voles due to their greater prevalence. Shrews were slightly infested. *L. Latyshevi* differed from other species by parasitizing in May and June and by host preference—Siberian chipmunks, squirrels, and small carnivores—and was found in almost all biocenoses of the area studied. Larvae of *Digenualea* sp. were found only occasionally. Among birds, only bank swallows were examined for trombiculidae and *Neochorogastria ripariae* and *N. ornata* were found on naked and sparsely feathered nestlings.

ASSOCIATION: Entomologicheskii otdel Instituta meditsinskoy parazitologii i tropicheskoy meditsiny im. Ye. I. Martsinovskogo Ministerstva zdorovokhraneniya SSSR, Moskva (Entomology Department, Institute of Medical Parasitology and Tropical Medicine, Ministry of Health SSSR) [LP]

OBTAINING LETHAL TOXIN AND *CL. HISTOLYTICUM* COLLAGENASE ON CASEIN NUTRIENT MEDIA

Vlasova Ye. V., and F. F. Tsurikov. *Zhurnal mikrobiologii, epidemiologii i immunologii*, no. 1, 1966, 112-114.

To isolate the maximum quantity of alpha-lethal toxin, collagenase, and cysteine activating protease, *C. histolyticum* strains S, 247, and 230-2 were cultured at 37°C for 24, 48, 72, and 96 hours on casein hydrolysate media, which, experiments showed, yielded most raw filtrate. Toxin and collagenase filtrates were purified and tested by

standard methods. Maximum yield of toxin appeared in 24 hours and maximum yield of collagenase in 48 hours after inoculation. Toxin strength was 500—1000 Dlm/ml. Effects of toxin and collagenase formation on the media were studied.

ASSOCIATION: Institut epidemiologii i mikrobiologii im. Gamalei
AMN SSSR (Institute of Epidemiology and Microbiology AMN SSSR)
[LP]

PRODUCTION OF RICKETTSIAL INTERFERON FROM MOUSE LUNG

Wei, Wen-pin, Ch'ing-wu An, and Lo-huai Ching. Some observations on the production of rickettsial interferon from mouse lung. Wei sheng wu hsueh pao (Acta microbiologica sinica), v. 12, no. 1, 1966, 29-33.

An interferon-like substance was found in the supernatant fluid of a suspension of mouse lung tissue after intranasal instillation of virulent material of *Rickettsia prowazeki*. It was ether-resistant, a feature quite distinct from other interferons. It could not be sedimented at 16,000 r.p.m. for 35 minutes. It could not be dialyzed, retaining its activities after acid and alkali treatment, but was completely destroyed after exposure to trypsin.

An interfering effect was observed on intracutaneous inoculation of this material for virulent *rickettsia* and vaccinia injected into the rabbit skin.

In the experimental rickettsial infection in guinea pigs, some amelioration of clinical symptoms was observed in the interferon-treated group of animals. The duration of fever was slightly shortened and the loss of body weight was slightly less.

A group of mice inoculated intranasally with this interferon was found to withstand partially the challenging effect of an intranasal inoculation of *rickettsia*.

The viability of rickettsial interferon was at least 3 months at 4°C.

ASSOCIATION: Ch'eng-tu Vaccine and Serum Institute [CR]

RICKETTSIA PROWAZEKI TISSUE CULTURE

Wei, Wen-pin, Shou-ni Ch'en, and Ch'ing-wu An. Tissue culture of *Rickettsia prowazeki*. I. Mouse embryo lung monolayer tissue cultures for the cultivation of *Rickettsia prowazeki*. Wei sheng wu hsueh pao (*Acta microbiologica sinica*), v. 12, no. 1, 1966, 34-40.

Trypsinized mouse embryo lung tissues were cultivated in the #199 synthetic medium containing 10% calf serum and antibiotics. Monolayers thus formed were infected with a suspension rich in *Rickettsia prowazeki* without antibiotics. Incubation was carried out at 34°C. Visible rickettsial multiplication began at 48 to 96 hours and the peak of multiplication was 4 to 7 days after infection. About 80% of the cells were found to be invaded by the rickettsia. The developmental cycle of intracytoplasmic rickettsiae was as follows: thread-like forms, strepto-bacillary forms, bacillary forms, and cocco-bacillary forms.

It is proposed to employ the term "initial bodies" instead of homogeneous inclusions, as it is assumed that the initial bodies occur only during the adaptation of the rickettsial strain to a new tissue-culture environment.

Forms of epithelial cells closely similar to that described by Zaslavsky for the monkey renal cells were seen both in the infected and uninfected monolayers. Cytopathogenic effects (CPE) could be visualized only with the aid of an oil immersion objective. These were: 1) bursting of the spindle-shaped and polygonal epithelial cells due to overcrowding of proliferating rickettsiae, 2) cellular degeneration and disintegration and 3) extracellular migration of rickettsiae. Multiplying rickettsiae appeared first in the star-shaped epithelial cells. There was marked vacuolization in the nodular cells of the epithelial type in the early stage of infection but it decreased later, when luxuriant intracytoplasmic parasitized rickettsiae could be seen between the vacuoles.

Fibroblasts appeared to be hardy cells. Even though they were overlaid with rickettsiae and were stained much deeper than usual, their general morphology was well preserved.

Intranasal instillation of the harvested tissue culture material to mice was shown to be pathogenic. Rickettsiae were abundant in lung smears of the infected mice.

It was estimated that the multiplication of *R. prowazeki* in the monolayer cells of the mouse embryo lung tissues was at least ten times greater than that in the original inoculum.

ASSOCIATION: Ch'eng-tu Vaccine and Serum Institute

[CR]

RICKETTSIA PROWAZEKI TISSUE CULTURE

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ASSOCIATION: Ch'eng-tu Vaccine and Serum Institute

[CR]

Q FEVER AND CHRONIC DISEASE

Yakunin, P. N. Effects of Q fever on associated chronic disease. Meditsinskiy zhurnal Uzbekistana, no. 2, 1966, 25-26.

Of 28 patients with Q fever, five had accompanying diseases. Although the Q-fever infection was comparatively mild, there was evidence that it complicated the other diseases and increased recovery time. This was true whether the other diseases (tonsillitis, otitis, colitis, etc.) set in at the height of Q fever or in the early stages of recovery. [LP]

COMPLEMENT FIXATION REACTION IN TOXOPLASMOSIS DIAGNOSIS

Yegorova, A. P. Sovetskaya meditsina, no. 3, 1966, 54-59.

For the complement fixation reaction, one of the most useful methods of toxoplasmosis diagnosis, most laboratories use an antigen prepared from mouse peritoneal exudate. This antigen often produces inconsistent reactions, giving positive results for healthy patients and patients ill with other diseases. In a series of experiments to evaluate specificity of the complement fixation reaction, various antigens were tested with human and animal immune sera. One weakly positive result was obtained with typhoid agglutinating serum in only one test series. Of sera from rabbits ill with listeriosis, 23.8% reacted with toxoplasmosis antigen. In other studies, sera without specific antibodies reacted with toxoplasmosis antigen. It is concluded that extreme care in carrying out the tests and in analyzing the results is necessary.

ASSOCIATION: Bakteriologicheskaya laboratoriya (Zav. A. P. Yegorova) Instituta akusherstva i ginekologii (Dir—chlen korr. AMN SSSR Prof. M. A. Petrov-Maslakov) AMN SSSR, Leningrad (Bacteriology Laboratory, Institute of Obstetrics and Gynecology, AMN SSSR) [LP]

TOXOPLASMOSIS IN UZBEKISTAN

Yermakova, S. A., and M. V. Los'. Distribution of toxoplasmosis among the population of Andizhan oblast. Meditsinskiy zhurnal Uzbekistana, no. 2, 1966, 23-25.

Testing women and children for toxoplasmosis showed that the disease was widely distributed in pregnant women but occurred rarely in children. The sources of infection are usually domestic animals. The necessity for widespread preventive measures is stressed.

ASSOCIATION: Kafedra mikrobiologii Andizhanskogo Meditsinskogo instituta (Microbiology department, Andizhan Medical Institute)
[LP]

VIRUS INCLUSIONS IN TISSUE CULTURE

Zaïrov, G. K., and I. I. Terskikh. Dynamics of the development of cytoplasmic viral inclusions of ornithosis—lymphogranule—trachoma in tissue culture. Meditsinskiy zhurnal Uzbekistana, no. 2, 1966, 8-12.

Using luminescent microscopy, the development of viral inclusions in characteristic ornithosis, trachoma, and lymphogranule tissue cultures were observed. These OLT viruses developed more rapidly in previously trypsinized cells than in transplants. Primary chick fibroblast cultures are recommended for manufacturing various clinical and diagnostic preparations and for investigating the development and morphology of cytoplasmic inclusions in view of the simultaneous maturation of large numbers of inclusions.

ASSOCIATION: Institut virusologii im. D. I. Ivanovskogo Akademiya Meditsinskikh Nauk SSSR (Dir.-Prof. V. M. Zhdanov)(Virology Institute, Academy of Medical Sciences SSSR)
[LP]

BACTERIA COUNTER

Soviet Union (USSR), no. 194, 1966, 24, col. 3.

A compact Soviet bacteria counter weighs half as much as similar devices manufactured by the New Brunswick firm and the British Spencer. Instead of a mechanical counter it has a more convenient electrical counter, and it has five filters for studying microorganisms that are invisible in ordinary light. [DM]

RESEARCH ON NEW METHOD TO IDENTIFY MICROBES

Scinteia (Rumania), 18 Feb 1966, 3, cols. 1-2.

Laboratories of the "Dr. Cantacuzino" Inframicrobiology Institute, Rumanian Academy of Sciences, and of the Pasteur Institute in Bucharest work on microbiological control by a new method known as "immunofluorescence." By using it it will be possible to identify such microbes as Streptococci, Brucella, and Anthrax B in three hours, instead of the several days needed for identification by conventional methods. Immunofluorescence is now being introduced into Rumanian laboratories. [DR]

TREES FOUND TO BE LETHAL TO MICROBES

Soviet Union (USSR), no. 191, 1966, 19.

After studying 30 species of trees, Ukrainian microbiologists have established that some of them are deadly

to pathogenic microbes that cause suppurative infections. The Siberian fir, Hungarian spruce, pin oak, and, especially, pine destroy up to three-quarters of all microbes settling on their leaves. Other trees with "medical" qualities are black locust, barberry, and grey birch. The scientists recommend that these trees be planted in cities. [DM]

III. ENVIRONMENTAL FACTORS

SETTLING OF COARSELY DISPERSED AEROSOLS ON VEGETATION

Dumskiy, V. F. *The inertial mechanism for settling of coarsely dispersed aerosols on the earth's vegetation.* IN: *Akademiya nauk SSSR. Doklady*, v. 159, no. 6, 1964, 1276-1279.

Results are presented which describe the equipment, procedures, and results of field tests carried out to determine the fallout rate of pollutants precipitated from the atmosphere by gravitational and inertial settling. Coarsely dispersed aerosols were collected on 20 pressure-plate-type collectors, each having a horizontal glass plate and a vertical glass, on the assumption that droplets settle on the horizontal plate by gravity and on the windward side of the vertical plates by inertia. The equipment was placed close to the tops of rather sparse vegetation averaging about 30 cm high. After examining the glass plates with a microscope, the average of the ratio n_v/n_h for 20 points on each glass was obtained for each droplet size fraction (n_v is the average number of droplets of a given fraction settling per unit area on the vertical plate and n_h is the same for the horizontal plate). The tabulated values of this ratio obtained for fractions with different drop diameters and different wind velocities show that the density of droplets of the same size class on the vertical plates was several times greater than on the horizontal plates, thus directly proving that inertial settling on vegetation may predominate over gravitational settling. The problem of the propagation and settling of heavy pollutants by inertial as well as gravitational settling was approached theoretically by deriving and solving the diffusion equation, then solving the original equation for the concentration of pollutants by inverse Laplace transformation, obtaining

$$C(x, h) = C_0(x, h) - C_1(x, h)$$

where C_0 is Round's solution of the same problem without inertial settling. Formulas are then derived for determining the density of pollutants deposited on the ground and under or on the vegetation (per unit ground surface). Comparisons of experimental data with the theoretically derived data showed much better agreement than calculations with Round's formula. A simple approximate formula is given for practical use, which is also claimed to yield better results than Round's formula. [EO]

VERTICAL PROFILES OF TEMPERATURES AND WIND VELOCITIES IN THE SURFACE BOUNDARY LAYER OF THE ATMOSPHERE

Gurvich, A. S. *Fizika atmosfery i okeana*, v. 1, no. 1, 1965, 55-65.

Universal functions for vertical wind velocity and temperature (lapse-rate) profiles are derived on the basis of the Monin—Obukhov theory from analyses of measurements of these profiles and simultaneous measurements of pulsations of vertical turbulent heat and momentum fluxes. Scales of the length L and temperature T^* are obtained from Monin—Obukhov formulas. Then, assuming similarity of the vertical profiles of wind velocity $u(z)$ and temperature $T(z)$, the following equations are obtained:

$$u(z_2) - u(z_1) = \frac{v_*}{\nu} \left[f\left(\frac{z_2}{L}\right) - f\left(\frac{z_1}{L}\right) \right] \quad (1)$$

$$T(z_2) - T(z_1) = T^* \left[f\left(\frac{z_2}{L}\right) - f\left(\frac{z_1}{L}\right) \right] \quad (2)$$

where v_* is the dynamic velocity and $f(\zeta)$ is some universal function of the argument $\zeta = z/L$. Finding the form of this function makes it possible to determine the remaining characteristics of turbulence, such as the Ri number and the exchange coefficients. Theoretical considerations (Monin—Obukhov) permit establishing asymptotic behavior of $f(\zeta)$, i.e., when $S \rightarrow 0$ (a condition close to neutral equilibrium)

$$f(\zeta) \sim \ln \zeta + \text{const.} \quad (3)$$

When stratification is decidedly unstable, i.e., when $\zeta \rightarrow -\infty$,

$$f(\zeta) \sim c\zeta^{-1/3} + \text{const.} \quad (4)$$

Finally, when there is a pronounced inversion, $\zeta \rightarrow \infty$,

$$f(\zeta) \sim c_2\zeta + \text{const.} \quad (5)$$

The theory used here is based on two assumptions: 1) the vertical turbulent heat flux q and momentum flux τ are vertically constant in the surface boundary layer; and 2) the wind and temperature profiles are similar, i.e., $K_T/K = \alpha$ is a general constant. The asymptotic formula (4) was found to agree satisfactorily with experimental values (R. D. Taylor. *Izvestiya AN SSSR. Ser. geofizika*, no. 12, 1960) when $c = 1.3-1.4$. Good agreement between theoretical results and experimental results obtained under field and laboratory conditions was noted for turbulence under conditions close to neutral. Theoretical and experimental investigations under inversion conditions are far less abundant. Monin and Obukhov, using a semiempirical hypothesis, obtained a value of $c_2 > 5.5$.

In 1962—1963, personnel of the Tsimlyansk Scientific Station of the Institute of the Physics of the Atmosphere, AN SSSR, carried out synchronized measurements of turbulent vertical heat and momentum fluxes at a height of 4 m and constructed vertical temperature and wind velocity profiles. The results they obtained are discussed and some graphs are presented in the original article.

ASSOCIATION: Institut fiziki atmosfery, Akademiya nauk SSSR (Institute of the Physics of the Atmosphere, Academy of Sciences USSR) [EO]

WIND SHEAR AT UZBEKISTAN AIRPORTS

Isamukhamedova, U. Strong vertical wind shear in takeoff and landing zones of Uzbekistan airports. In: Sredneaziatskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut. Trudy, no. 25(40), 1966. Voprosy regional'noy sinoptiki Sredney Azii (Problems of regional synoptics in Central Asia), 74-82.

The effects of head winds and crosswinds on takeoffs and landings are discussed. In 1964, the Commission on Aviation Meteorology recommended studies of wind effects in the lowest 100-m layer of air at the ends of runways. In addition, in response to recommendations presented by N. V. Petrenko, Chief of the Department of Aviation Meteorology of the Central Weather Forecasting Institute, investigations were initiated on wind shear in the lowest 1000 m above Uzbekistan airports. The first part of the work, which was devoted to statistical processing of data on pronounced wind shear, is reported here. *Wind data from 11 principal airports in Uzbekistan, where pilot balloon observations were conducted from 1959 through 1963 were used. Every case in which the wind velocity equaled or exceeded 15 m/sec in this layer and the wind shear $\partial v / \partial z$ equaled 5 m/sec per 100 m was included in this statistical processing; cases in which the wind shear exceeded 4 m/sec were included if the wind velocity noted at the weather station reached 15 m/sec (see Table 1).

Table 1. The number of observations when pronounced wind shears were noted (first line) and the total number of observations during the Five-Year Period (second line)

Station	Year					Table for 5 yr.
	1959	1960	1961	1962	1963	
Nukus	18 609	14 352	41 1367	18 1064	14 571	105 4263
Urgench	27 293	18 357	14 361	3 255	13 188	75 1454
Bukhara	18 466	16 538	26 552	17 765	35 794	112 3115
Karshi	none	13 890	8 653	6 662	5 634	32 2839
Termez	4 305	6 344	4 1275	4 530	2 571	20 3025
Namangan	1 707	1 464	0 457	1 455	2 407	5 2490
Andizhan	0 788	1 887	4 629	1 604	6 590	12 3498
Kokand	16 699	22 862	42 1106	45 1611	32 942	157 5220
Fergana	2 546	0 521	0 543	1 582	1 537	4 2729
Tashkent	1 383	2 565	9 805	8 1157	16 1410	36 4320
Samarkand	6 770	9 778	15 1659	12 1235	5 697	47 5139
Total for 11 stations	93 5566	102 6858	163 9407	116 8920	131 7341	605 38092

The stations were divided into four groups: northern region (Nukus, Urgench), southern region (Bukhara, Karshi, Termez), Fergana Valley region (Namangan, Andizhan, Kokand, Fergana), and central region (Tashkent, Samarkand). This was for further statistical processing to determine the heights above the surface with maximum frequency of pronounced wind shear (5 m/sec per 100 m) and the seasonal distribution of wind shear. The summary tables presented below are based on 60 preliminary charts compiled in this work. Future investigations will be

Table 2. Distribution with height of the number of observation periods with pronounced wind shear for 1959--1963

		Region																
		Northern				Central				Southern				Fergana Valley				
Height, m		Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Total
1000		—	—	—	—	—	—	2	1	—	—	—	—	—	—	—	—	5
900		1	1	1	—	2	1	—	1	1	—	—	—	—	—	—	—	8
800		—	—	—	—	—	—	—	—	1	—	—	—	—	2	1	—	4
700		2	1	—	—	3	2	1	1	3	—	2	—	—	—	3	3	21
600		3	1	1	—	5	4	1	—	2	1	2	—	—	—	—	—	27
500		6	8	1	5	4	3	3	—	6	3	7	5	3	6	7	3	70
400		17	9	5	6	4	5	6	2	9	6	12	8	8	18	18	13	42
300		11	13	7	8	1	2	8	1	16	10	16	5	6	18	13	17	52
200		11	21	6	8	2	4	5	1	10	7	16	3	7	15	8	10	34
100		7	5	3	5	2	2	—	1	1	2	8	—	1	3	2	—	42
Ground		7	5	3	5	2	2	—	1	1	2	8	—	1	3	2	—	42
Total . .		58	59	24	32	23	23	26	8	49	29	63	19	25	62	55	50	05

directed toward: 1) studies of wind shear in the very lowest layer between the anemometers and the lowest pilot-balloon readings; 2) statistical analyses of the frequency of strong winds (exceeding 15 or 20 m/sec) in the lowest 1000-m layer, independent of wind shear; 3) investigations of air and weather conditions associated with the appearance and disappearance of wind shear; and 4) development of methods for short-range forecasting of wind shear.

Table 3. Distribution of pronounced vertical wind shear by intensity for 1959--1963

$\frac{\partial v}{\partial z}$, m/sec per 100 m	Region												Total				
	Northern				Central				Southern					Pergana Valley			
	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn	Winter	Spring	Summer	Autumn		Winter	Spring	Summer	Autumn
5	1	-	-	-	2	-	-	-	3	-	3	-	1	1	3	1	15
6	15	19	5	3	5	8	12	2	12	7	9	6	2	13	15	10	143
7	10	15	7	7	7	3	7	-	13	7	24	6	5	17	10	15	153
8	9	9	6	9	2	7	3	6	10	3	7	4	7	8	6	8	98
9	5	7	2	6	1	1	1	1	7	5	11	3	5	6	8	7	76
10	5	2	2	2	1	2	1	2	2	4	5	-	3	5	3	2	41
11	7	4	2	5	4	-	1	2	2	-	-	-	2	6	6	5	46
12	1	1	-	-	-	-	1	1	-	3	2	-	-	3	1	1	14
13	3	1	-	-	-	1	-	-	-	-	-	-	1	-	2	1	8
14	-	1	-	-	-	-	-	-	-	-	1	-	-	1	1	-	4
15	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
16	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
17	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	2
18	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	3
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	58	59	24	32	23	23	26	8	49	29	63	19	25	62	55	50	605

Table 4. Number of cases of pronounced wind shear occurring simultaneously at several stations

Number of stations	Winter						Spring						Summer						Autumn						Total
	1959	1960	1961	1962	1963	5 yr	1959	1960	1961	1962	1963	5 yr	1959	1960	1961	1962	1963	5 yr	1959	1960	1961	1962	1963	5 yr	
1	19	19	16	17	21	92	22	24	30	16	22	144	11	15	28	23	25	102	16	19	25	15	18	93	431
2	3	3	7	2	4	19	5	3	3	4	4	18	4	5	5	8	3	25	3	1	2	2	1	9	71
3	2	1	—	1	—	4	2	—	1	—	—	7	—	1	4	—	—	5	—	—	—	—	—	—	16
4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	1	—	—	1	2
Total	24	23	23	20	25	115	29	27	34	20	29	169	15	21	38	31	28	133	19	20	27	17	19	103	520

ASSOCIATION: Sredneaziatskiy nauchno-issledovatel'skiy gidrometeorologicheskiiy institut (Central Asia Scientific Research Hydrometeorological Institute) [EO]

AEROSOL AND CLOUD STUDY FACILITIES AT OBNINSK

Litvinov, I., and O. Volkovitskiy. *Znaniye-Sila*, no. 3, 1961, 10-11.

The location of the new aerosol research facilities of the Institute of Applied Geophysics (Main Administration of the Hydrometeorological Service, Soviet of Ministers USSR) has been described as being at Obninsk, site of the 300-m meteorological tower. The large vertical cloud chamber is as high as a five-story building; there are four balconies around its inside walls, and a slat floor is installed just under the ceiling. Instruments can be suspended at any point in the chamber by lowering them through the slat floor. Observation windows and an inlet port with massive doors are installed in the side walls. Numerous pipes (diameters of 2 centimeters to several tens of centimeters) form a maze on the outside of the chamber. All machinery and valves controlling the pipelines are regulated from a central console which also contains all signalling facilities. All instrument readings are registered on the main console. The steam for the cloud chamber is produced in boilers operating at a pressure of 6 atm. In 2 or 3 min the 3200-m³ chamber can be filled with fog having a visibility of about 2 m.

The aerosol laboratory has a special horizontal wind tunnel for studying icing phenomena. Air is forced through its working section (diameter 80 cm) at almost 300 km/hr by a fan driven by a 400-kw motor at a rate

of 150,000 m³/hr. This flow is exhausted into a dust catcher.

Two five-story, 100-m³, cylindrical, thermobaric chambers supported on heavy supports are located in a room adjacent to the horizontal wind tunnel. These chambers have double walls; coolant is circulated between the walls, and the outside is insulated with thick coats of foam plastic. The pressure inside the chambers drops to 0.04 atm and the temperature to -45°C after the refrigerating equipment has been running for several hr and the vacuum pumping for an hour. Clouds can be forced to travel from a height (simulated) of 5.5 km to the maximum heights at which they can exist. Ascending and descending currents can be induced in the chamber, clouds evacuated, and the chamber filled with fresh air or a "new" cloud. Research geophysicists are now learning how to obtain "supercooled" clouds and maintain them for the longest possible time.

A 50-m vertical wind tunnel was installed to facilitate studies of raindrops and rain clouds. This wind tunnel begins at the second story of a hermetically sealed chamber and is filled with pure, dry air at a set temperature by special air-conditioning facilities. The entrance to the wind tunnel, which looks like a gigantic loudspeaker horn, is under the ceiling of the sealed chamber. Aerosol particles, water droplets, or dust particles can be introduced through jets; they are mixed with the air stream and pass smoothly, at relatively low speeds, through the working section of the wind tunnel. Thus, the slowly rising currents usually seen in stratus clouds can be studied here. The blower fan located in the upper part of the wind tunnel can be reached from the second floor of the tower by means of an elevator. Large observation windows are located on all floors along the working section. Special manipulators controlled from a central console make it possible to install sensors at any point in the wind tunnel. [EO]

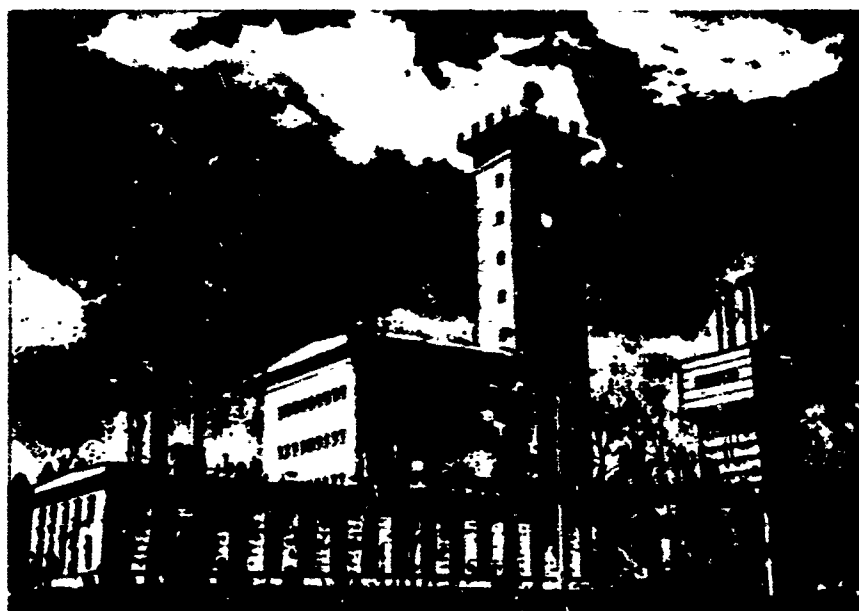


Fig. 1. Aerosol building

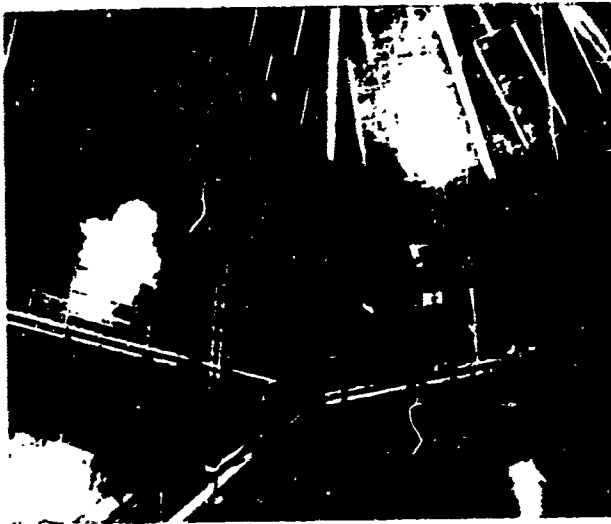


Fig. 2. Cloud chamber

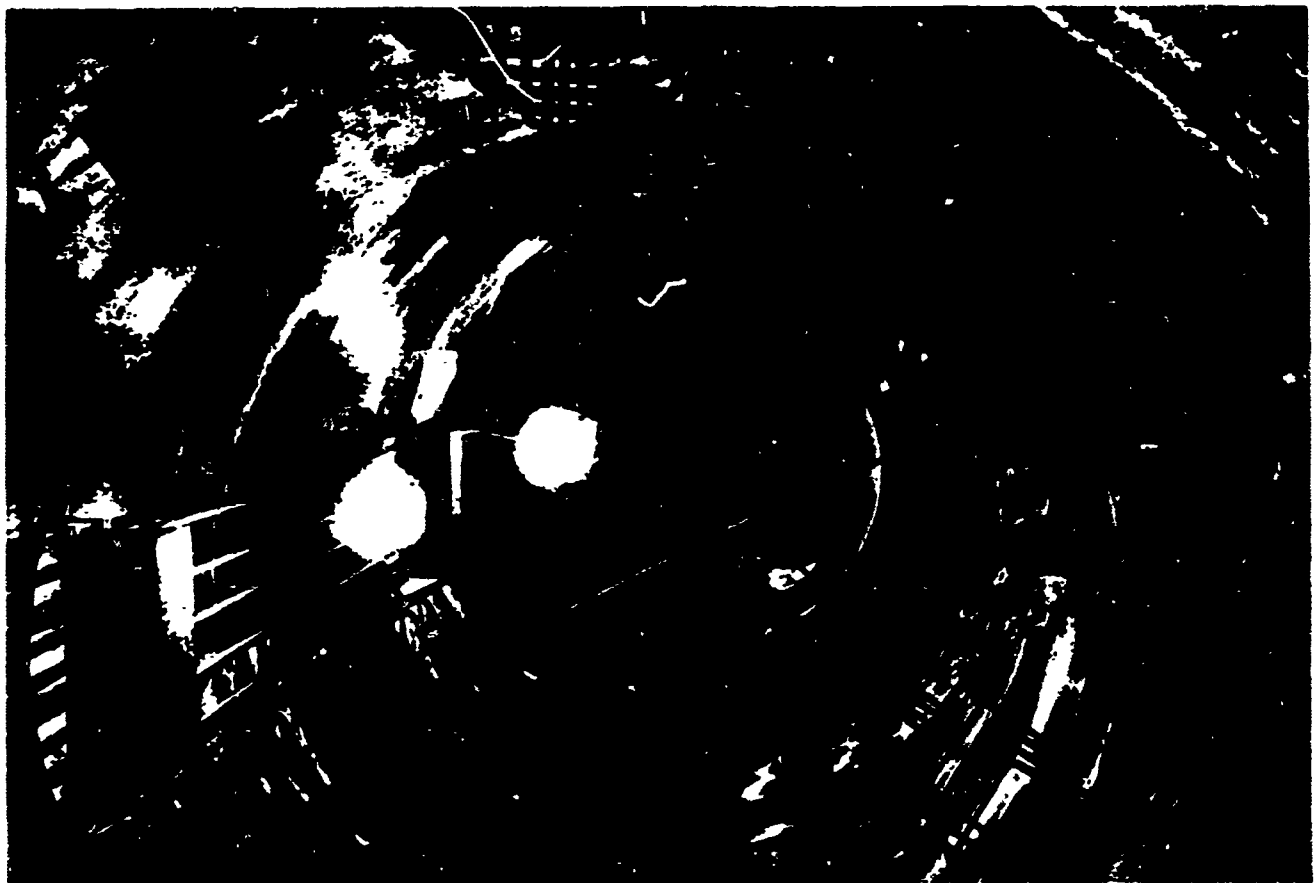


Fig. 3. Thermobaric chamber (looking downward)

CATALOG OF PROPOSED VEGETATION AND SOIL PHOTOINTERPRETATION KEYS

Mavlov, E. R. *Card catalog of vegetation and soil interpretation keys. Geodeziya i kartografiya*, no. 3, 1966, 52-55.

Extensive use of aerial mapping techniques in the Soviet Union has pointed up the need for making more detailed field and laboratory studies of terrain features to develop a comprehensive catalog of precise photointerpretation keys. An elaborate proposal is presented for such a project. Initially, the work would concentrate on vegetation and soil features, their relationships to each other, to the topography, and to the water table. All establishments in the Main Administration of Geodesy and Cartography would be asked to support this work by sending out field expeditions (beginning in 1965), under the leadership of senior editors, to collect, particularize, and systematize descriptive information of value for photointerpretation purposes. Images of mapping features or objects appearing on both aerial and terrestrial photos would be studied in situ, and anything which might possibly affect a photo image, especially the relationship of the feature to its environment and to other features, would be studied in detail. Observations and description would be recorded on the backs of the photos. Subsequently, laboratory studies would be made of the same areas and photographs using general-purpose photogrammetric instruments and techniques. In these operations exhaustive measurements would be made, including such data as the distances between tree crowns, diameters of tree crowns, etc. The photogrammetric data would then be compared and correlated with the field descriptions, and the finalized information would be entered on 6 x 9 cm cards. The following photographic data would also be included on these cards: geographic position of the feature; date, time, and scale of the aerial photos; type of camera and lens; focal length of the camera; flight altitude; type of film (spectrozoal and color films); and type and number of the photopaper. Descriptive items to be noted for each feature would include such details as the type of forest, the percentage of each type of tree, tree heights, widths, density of forest, age of stand, ground cover, and soil types. The location of each feature would be described in relation to local relief, slope exposure, soil moisture, and other terrain features. The terrestrial and aerial photos would be attached to an envelope or put into one, accompanying the card. In the catalog, the cards would be filed first by terrain feature and then by vegetation type.

[ER]

SYMMETRY OF TURBULENCE IN THE SURFACE BOUNDARY LAYER OF THE ATMOSPHERE

Mmin, A. S. Fizika atmosfery i okeana, v. 1, no. 1, 1965, 45-54.

Seven symmetry properties of turbulence in the surface boundary layer are enumerated and defined for air over a flat, homogeneous, underlying surface under stable conditions (not changing in time). They are stability, horizontal homogeneity, horizontal symmetry relative to wind direction, local homogeneity about the vertical axis, local symmetry about the vertical axis, similarity (invariance of probability distributions for values of hydrodynamic fields relative to similarity transformations), and local similarity. The following constraints are imposed by dynamical equation on the statistical characteristics of turbulence: average values of wind velocity, pressure gradient, and temperature fields depend only on height z ; the vertical radiative heat flux in this layer of air is constant; and one-point second moments of pulsations depend only on z . The Reynolds equations connecting the mean values of the hydrodynamic fields and the second moments of pulsations are written on the assumption of horizontal symmetry relative to the wind direction and averaging the equation of motion. Expressions are derived for the second moment of velocity pulsations, mixed second moments of velocity, and temperature pulsations. Since the pressure pulsations used in these expressions are not a local characteristic, semiempirical hypotheses are utilized; pressure pulsations tend to equalize velocity pulsations along different directions in space and the other characterizes the anisotropy caused by the underlying surface. In the case of well-developed turbulence, with z not too small, terms containing molecular viscosity and heat conductivity can be neglected. Simplified equations for second moments of velocity, pulsations, and mixed second moments of velocity and temperature pulsations are derived to serve as a basis for the turbulent energy balance, which does not depend on the hypotheses. On the assumption that the horizontal turbulent heat flux is small (it is zero with neutral stratification and free convection), a simple relationship connecting the dimensionless variations in velocity pulsations is derived which yields results that agree with experimental values. Other expressions are derived for the ratio of the exchange coefficients for heat and momentum and for the coefficients of anisotropy of velocity pulsations.

ASSOCIATION: Institut fiziki atmosfery, Akademiya nauk SSSR (Institute of the Physics of the Atmosphere, Academy of Sciences SSSR) [EO]

DISTRIBUTION OF TURBULENCE CENTERS IN THE ATMOSPHERE

Patsayeva, V. A. Heterogeneity of the wind in the atmosphere and the parameters of average motion. IN: Tsentral'naya aerologicheskaya observatoriya. Trudy, no. 62, 1965, 122-137.

Vertical, time-wise profiles of the wind field, constructed from radiosonde data collected in fifty-six 6-hr intervals in four atmospheric layers (0—4, 4—9, 9—13, and 13—17 km), were analyzed to study the structure of the inhomogeneities of the wind under different synoptic conditions. The procedure used was to select, by synoptic characteristics, a number of wind perturbation (disturbance) centers in the wind field in a unit area of the vertical wind profile over the Moscow region. The character of the baric field in the lower troposphere was determined from ground-level weather maps and that of the upper troposphere from 500-mb charts. The study indicated that the number of short-lived perturbation centers in a wind flow with horizontal dimensions of the order of tens or hundreds of kilometers, and in a layer several kilometers thick, was comparatively small, given a steady average motion of $Ri_{av} = 100$, $R_{Tav} = 48$. This increased to a maximum when the air flow was less steady; however, when it reached $Ri_{av} < 70$, $R_{Tav} < 40$, the number of perturbation centers decreased. The main reason for this decrease was intense turbulent mixing which smoothed out average-size perturbations. Turbulence occurred at the edges of the centers of the perturbed areas where the gradient was greater and where, in comparatively thin layers, the Ri and R_T values were close to unity. The maximum number of these centers in the free atmosphere occurred when the parameters of average motion (computed for a layer 4 km thick) were as follows:

	Lower troposphere	Upper troposphere	Stratosphere
Velocity (m/sec)	10—15	15—25	7—15
Vertical velocity gradient (m/sec per hr)	1—4	2—6	1—3
Ri_{av}	90	70	—
R_{Tav}	48	40	—

In addition, in the upper troposphere in a 4-km thick layer, for a period of 6 hr or at distances of ~300 km, 5—9 centers were found which extended horizontally 50—200 km and vertically 1—2 km. The dimensions of these centers in the lower troposphere and in the stratosphere were half these sizes. The largest number were found in the northern air flow on the back side of the lows and the front side of the highs. Diurnally, most of the centers occurred in the daytime and evening hours.

ASSOCIATION: Tsentral'naya aerologicheskaya observatoriya (Central Aerological Observatory) [ER]

mountain (the case of the so-called mountain breeze). The process (using the A. A. Dorodnitsyn method) is described by a system of partial differential equations with given initial and boundary conditions. A special parameter p , which depends on atmospheric stratification, characterizes changes with height in the turbulent mixing coefficients for momentum and temperature; the closer the stratification is to equilibrium, the larger p is. Considering $g\beta$ (the product of gravity acceleration and the coefficient of thermal expansion of air— $1/273$), l (the Coriolis parameter), K_0 (the turbulence coefficient at the level of roughness z_0), G (the vertical gradient of potential temperatures at the initial instant), and p as known parameters, the characteristic scales of the phenomenon are given linearly as $r_0 = 10^3$ m, the angular value as $\theta_0 = 1$, as well as the characteristic slope of the surface α_0 , and the characteristic temperature deviation $T_0 = 5^\circ$. The first system of equations is rewritten in dimensionless form; then the characteristic values of the velocity components, the vertical scale of the phenomenon h , and the characteristic time t_0 are determined. This system is solved in the form of a series in powers of τ , where $\tau = t^{1/p+1}$

$$\{v_r, v_\theta, v_z, T\} = \sum_{n=0}^{\infty} \{u_n, v_n, w_n, T_n\} \tau^n,$$

and the coefficients of the expansion u_n, \dots, T_n are represented as products of functions of r and θ (depending on the boundary conditions and the relief form) and functions of ζ , which are the same for different types of relationships $f_n(r, \theta)$ and $\alpha(r)$, where

$$\zeta = \left(\frac{p}{p+1} \right)^2 \frac{z^{1-\frac{1}{p}}}{t}.$$

The values of the parameters are selected so as to make it possible to neglect the Coriolis force and the initial advective vertical temperature field. The surface temperatures, given here approximately, are for conditions prevailing shortly after sunrise. The model presented here describes the first 10—15 min of development of local winds. Graphs are given showing the distribution of temperatures and velocity components at various times and the velocity component of mountain breezes. It is noted that a mountain breeze develops with more turbulence than simpler types of local circulation ("pure" breezes or slope winds); the velocity field of a mountain breeze changes even in the first minutes after it begins.

ASSOCIATION: Odesskiy gidrometeorologicheskii institut (Odessa Hydro-meteorological Institute) [EO]

A RAWINSONDE DEVELOPED IN POLAND

Strauch, Edward, and Jerzy Chojnowski. Przegląd geofizyczny, v. 10(18), no. 1, 1965, 77-81.

A brief description is given of a new rawinsonde designed by the Division of Aerology, State Institute of Hydrology and Meteorology (Poland). In 1962, a simplified radiosonde, was developed by Division personnel to measure upper-level winds in conjunction with a radio theodolite. Data obtained with this new model are presented in tabular form and include maximum temperature differences (for each month) at different barometric levels, and errors in detecting thicknesses of layers with different temperature deviations from true values. The percentage of cases (in 1963) in which temperature differences amounted to 0° , $1-5^{\circ}$, $6-10^{\circ}$, $11-15^{\circ}$, $16-20^{\circ}$, or more than 20°C on particular isobaric levels, are also tabulated. The device includes such features as a transmitter which works on a frequency of 400 Mc, and a light-weight 7-v copper-magnesium battery for a power source. Pressure measurements are taken at intervals of 2-3 min immediately after the rawinsonde has been sent up. Commercial production of this type of rawinsonde has been started and will make high-level wind sounding available for systematic aerological observations.

ASSOCIATION: Zakład aerologii PIHM (Division of Aerology, State Institute of Hydrology and Meteorology)

[EO]

APPENDIX I

AVAILABLE TRANSLATIONS: CHEMICAL FACTORS

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APPENDIX III

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APPENDIX IV

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